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ABSTRACT

During the past eight years, educators in New York State have developed a system for supplying classroom teachers with information about the instructional decision making process and have developed within that system a body of suggestions which teachers might use in carrying out those decisions. Over fifty units of instruction at various stages of completion for use with pre-school to college students are contained in the Computer Based Resource Units (CBRU) system. This report summarizes the objectives of the system, the strategies used to meet those objectives, and the guidelines for developing CBRU. The guidelines include information on the writing of instructional objectives, the designation of content, materials, and activities, the formulation of measuring devices and the coding of components. (MC)

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FINAL REPORT

IMPROVING AND EXPANDING COMPUTER BASED RESOURCE UNITS

#OEC-0-71-4671 (615)

RESEARCH AND DEVELOPMENT COMPLEX

STATE UNIVERSITY COLLEGE AT BUFFALO

FINAL REPORT COVER SHEET

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Bureau of Education for the Handicapped
U.S. Office of Education
Washington, D. C.
Attn: Dr. Frank Withrow, Director

FROM: The Research Foundation of the
State University of New York
for and in conjunction with
State University College at Buffalo
1300 Elmwood Avenue
Buffalo, New York 14222

TITLE OF PROJECT: Improving and Expanding Existing Computer Based Resource Units

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Introduction

During the past eight years, educators in New York State have developed a system for supplying classroom teachers with information about the instructional decision-making process, and have developed within that system a body of suggestions which teachers might use in carrying out those decisions. Roughly speaking, activities have been of two types: system design and the development of content to incorporate into this system. The system itself has been largely determined and complete documentation of the system is proceeding rapidly.

This system, called Computer Based Resource Units was originated at the State University of New York at Buffalo by Dr. Robert S. Harnack and expanded at the Board of Cooperative Educational Services, Erie County #1 through a grant from E.S.E.A. Title III. System expansion to meet the unique needs of exceptional children was undertaken by the Regional Special Education Instructional Materials Center at the State University College at Buffalo in 1968. This computer retrieval system has been utilized by over twenty thousand classroom teachers during the period just described.

The development of Computer Based Resource Units has been continous since 1965, and currently there exist over fifty units of instruction at various stages of completion for use with pre-school to college students. Over three hundred educators in general and special education have been actively involved in the creation of these programs. The project described in this document was directed toward the improvement of that system with a view toward facilitating even more improved teacher decision-making for individualization of instruction.

Statement of the Problem

Procedures for developing Computer Based Resource Units have been developed gradually over the last eight years (the most recent publication related to this development is included in Appendix A). Accordingly, Unit development has proceeded adhereing more or less rigoreusly to stated guidelines. In addition, Units had been developed through a variety of funding arrangements so that time and resources available had tended to vary greatly. As a result, some Units had been developed with considerably greater care and supervision than had other Units. Due to both of these factors - sophistication of the system when a given Unit was developed and the resources available for development of that Unit - the quality of individual Computer Based Resource Units varied considerably.

Objectives of the Project

1. To revise and up-date existing Computer Based Resource Units in order to further facilitate teacher decision-making with regard to the individualization of instruction.

2. To expand the content of existing Computer Based Resource Units in accordance with the identified needs of teachers in general and special education.

3. To develop a more systematic program of user feed-back for the continuous improvement of all Computer Based Resource Units.

4. To establish priorities for the development of new Computer Based Resource Units for the next three years.

Strategies Related to Objective One

Objective 1. To revise and up-date existing Computer Based Resource Units in order to further facilitate teacher decision-making with regard to the individualization of instruction.

During the first weeks of the project, a priority ranking for Computer Based Resource Unit revision was determined on the basis of: (a) feedback from the professional staff of the NYSEIMC, (b) teacher/user demand as determined by an analysis of Computer Based Resource Unit requests (over five thousand) from the preceding year, (c) an analysis of the evaluations of over 300 requestors from the preceding year, and (d) an analysis of the actual computer generated materials by the staff at the R.S.E.I.M.C. As a result of those analyses, a list of Computer Based Resource Unit titles was developed, assigning priorities for both the summer and academic year revisions.

A workshop was conducted during subsequent weeks with ten experienced classroom teachers to complete revisions of the following Computer Based Resource Units:

1. Speaking and Listening
2. ITPA
3. Communication
4. Transportation
5. Transportation's Influence on American History
6. Job Interview
7. Job Attitudes
8. Solar System
9. Measurement
10. News Media in American Society
11. Going To and From School

These revisions were completed by September 1971, and included the following:

(a) editing of all objective lists (see samples in Appendix B)

(b) additions, modifications and partial deletions of content listings

(c) additions, modifications and partial deletions of activities

(d) additions and deletions of instructional materials listings, and

(e) modifications and deletions of measuring devices listings.

The list of variables used to code each item in a Computer Based Resource Unit was scrutinized and revisions (especially regarding Interests) were made (See old and new lists in Appendix C). Computer programs were implemented during this period to perform various analyses on each unit. From these analyses, it became possible to determine accurately and efficiently the range and density of suggestions in each Computer Based Resource Unit (See Appendix D). All data were processed through key punching and remote terminal entry. High-speed printouts were then scrutinized and final editing completed. From the analyses described above, tailored request forms were developed so that classroom teachers using the service are able to make choices from a valid range of variables (See Appendix E). During the period October 1971 to May 1972, essentially the same process was employed in revising the following list of Computer Based Resource Units:

12. Conservation of Natural Resources
13. Air Pollution
14. Communities of Man
15. American People
16. Movigenics

Strategies Related to Objective Two

Objective 2. To expand the content of existing Computer Based Resource Units in accordance with the identified needs of teachers in general and special education.

The analyses described in Objective 1 were used to identify objectives within each Computer Based Resource Unit for which there was insufficient data (See Samples in Appendix F). Concurrent with the revising efforts described in Objective 1, new items were developed wherever possible to provide at least minimal data for each objective. In those instances

where time and resources were insufficient to provide at least minimal data, the objective links which accompany the request forms were modified so that, although the objectives were judged relevant and remained in the computer data bank, they are not currently displayed to the requestor. Implications of this strategy are discussed in Objective Four of this report.

A major problem expressed by teachers/users of Computer Based Resource Units had been the paucity of information regarding instruction materials suggested in some of the Units. A form was developed and used during the workshops to facilitate the compilation of useful data for each material (See Appendix G).

A brochure containing abstracts of each Computer Based Resource Unit currently available was developed in order to provide classroom teachers with a brief overview of the contents of the data bank and has been judged very useful in facilitating decision-making for those interested in the system (See Appendix H).

Strategies Related to Objective Three

Objective 3. To develop a more systematic program of user feedback for the continuous improvement of all Computer Based Resource Units.

Prior to the implementation of this project, revision of any Computer Based Resource Unit was a complex and tedious task. Specifically, a Unit would have to be virtually recreated ("re-written") completely with the desired modifications. During the past several months, programs and procedures have been developed so that a single item may be added, modified, or deleted with little impact on the system as a whole. This provides capability for relatively continuous modification of the data base.

User feedback prior to the project was a manual procedure which included mailing a questionnaire to each user several days after the processing of each Computer Based Resource Unit (See Sample in Appendix I). A new questionnaire form was developed which was judged superior to the previous form in soliciting relevant information, regarding Computer Based Resource Unit modifications (See Appendix J). Additionally, programs were developed which permit the questionnaire to be printed as a part of the Computer Based Resource Guide itself. A teacher need only tear off the questionnaire and mail it to the Research and Development Complex where evaluations are compiled for each Unit topic. Programs and procedures are presently being developed to store this data within a computer thus enabling thorough and efficient analysis upon request.

Documentation of procedures including a structured interview are near completion for soliciting additional teacher/user feedback. These techniques will be piloted with at least fifty classroom teachers before the end of the current academic year and evaluated on the basis of usefulness and cost-effectiveness.

Currently, the impact of using Computer Based Resource Units with exceptional children is being assessed with regard to both pupil achievement and teacher attitudes. This evaluation is being conducted as a part of project to assess Computer Based Resource Unit impact on all children; results of this evaluation will be reported by August 1, 1972.

A brochure has been developed for wide-spread dissemination regarding the status of all operational Computer Based Resource Units (See Appendix K). This brochure will be up-dated on a regular basis so that interested educators are apprised of the availability of existing programs and encouraged to provide input for system development and modification.

Recommendations Related to Objective Four

Objective 4. To establish priorities for the development of new Computer Based Resource Units for the next three years.

As described in Objective 2, there exist several relevant objectives in the computer data bank for which there is insufficient data related to content, activities, instructional materials and measuring devices. Inclusion of data for these objectives within existing Computer Based Resource Units should have a high priority for curriculum development during the next three years.

The analyses of the Computer Based Resource Units which were selected for revision during the last year indicated that less than ten percent of the objectives had adequate measuring devices for assessing pupil achievement of those objectives. A detailed description of this problem and a plan for ameliorating this problem are contained in a proposed ammendment to this project which has already been submitted. The compilation and inclusion of these measuring devices should have a high priority in future development.

Teacher/user evaluations indicate a strong need and interest in Computer Based Resource Units which provide assistance in individualizing instruction in fundamental skill development especially in the area of reading and language arts. At this point in time a clear-cut appraisal of the format of such programs has not been determined. The primary alternative strategies identified thus far are (1) development of computerized programs in which individual skills are specified in the objectives and the program is not associated with any overriding theme or topic, and (2) development of units of instruction which are topical in their approach, are concerned with conceptual development within a discipline, and attempt

to provide experiences in skill development within the context of that overall topic. This uncertainty needs to be resolved either on an empirical philosophical and/or experiential basis and a high priority assigned to this area in future Computer Based Resource Unit development.

Finally, it is felt that most if not all, classroom teachers should have assistance in making decisions for classroom management and curriculum planning via the Computer Based Resource Unit system. This is not to imply that a Computer Based Resource Unit needs to be developed for every area of curriculum and instruction; indeed in some areas such as basic mathematics and typing, Computer Based Resource Units may be of no value at all. This needs to be determined on a topic by topic basis. However, it is felt that Computer Based Resource Units can be helpful to teachers of children of all ages and in most areas of the curriculum. A high priority should be assigned to areas such as career education, environmental education, the fine and performing arts, and science education in future development of Computer Based Resource Units.

APPENDIX A

GUIDELINES FOR DEVELOPING COMPUTER BASED RESOURCE UNITS

GUIDELINES FOR DEVELOPING

COMPUTER BASED RESOURCE UNITS

PROFESSIONAL STUDIES RESEARCH AND DEVELOPMENT COMPLEX

STATE UNIVERSITY COLLEGE AT BUFFALO

Revised March, 1972

INTRODUCTION

The following work represents a synthesis of the thinking of many educators who have worked closely with the development and refinement of Computer Based Resource Units over the major part of the last decade. This concept for using computers for curriculum planning was originally conceived and implemented by Professor Robert S. Harnack, State University of New York at Buffalo.

Since the nature of instruction, the role of the classroom teacher, and the needs of learners are currently undergoing drastic changes, the information contained in a Computer Based Resource Unit may not be the same kind of information educators will need in the future. Therefore, these instructions should be viewed as currently the most helpful guidelines which can be documented for developers of Computer Based Resource Units.

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DEVELOPING COMPUTER BASED RESOURCE UNITS

The development of a Computer Based Resource Unit (CBRU) includes two distinct, separate, and equally important operations.

Operation I: The first operation involved production of the software, i.e., the writing of instructional Objectives, Content, Activities, Materials, Measuring Devices.

Given a center of interest or a unit topic such as "Drugs and Narcotics", those persons responsible for formulating the software (Unit writers) must produce a series of instructional Objectives related to the topic. Subsequently, instructional Content, Activities, Materials and Measuring Devices (the components) which are related to one of more of the objectives must be developed or identified.

The production of these five components involves a great deal of professional expertise and imagination so that literally hundreds of Objectives, Content Items, Activities, Materials, and Measuring Devices will be available to teachers whose students possess a wide variety of interests, needs and aptitudes.

Operation II: The second operation involves the coding of the aforementioned components in order to prepare them for computer retrieval. Each statement is assigned an identification number, and through the use of coding forms, every Content Item, Activity, Material, and Measuring Device is coded to every Objective to which it is related. In many cases, one Activity may be related to two, or three, or more Objectives. Subsequently, each statement is coded to several learner characteristics so that, for example, an instructional Material is assigned to its appropriate "reading level." Other learner characteristics would be student interests, sex, chronological age, etc.

Once these two operations have been completed, data clerks will enter all written and coded information into computers. The result is a Computer Based Resource Unit stored on disk for retrieval.

By following specified procedures, a teacher can obtain a Computer Based Resource Guide which, generally, consists of two parts:

Part A: For each objective selected, the teacher will receive all of the appropriate content, large and small group activities, materials, and evaluation devices related thereto. This material is for use with the total class.

Part B: Each student will receive an individually tailored curriculum guide related to the objectives selected and screened on the basis of his unique characteristics.

The information which follows will provide suggestions and guidelines related to these Operations.

I. WRITING INSTRUCTIONAL OBJECTIVES:

A. Characteristics: Unlike "Mager" type objectives, the Objectives which are formulated for Computer Based Resource Units are less specific and do not include the "criteria of success" or measuring devices. Inherent in the concept of CBRU's is the posture that individualized instruction denotes -- among other things -- that the means for meeting or achieving a particular objective may vary from child to child, depending upon his interests, needs and aptitudes. An instructional objective, therefore, should be specific enough to be measurable but general enough to be measured in a variety of ways.

B. Criteria: Following are a few general criteria for writing instructional objectives for CBRU's:

1. Behavioral: The objective must call for performance of a measurable task -- listing, naming, analyzing, using, locating -- as opposed to some vague act such as knowing or understanding.

   Poor: To know the factors in production which affect prices.*

   Better: To analyze the factors in production which affect prices.

   Poor: To understand that contaminated air has an affect on lung ailments.

   Better: To explain the effect of contaminated air on lung ailments.

2. Student Oriented: The objective must call for the performance of a specific task by the student, rather than by the teacher. If teachers perform the behaviors, they will probably do most of the learning.

   Poor: To help students understand the principles of evaporation and condensation.

   Better: To explain the principles of evaporation and condensation.

   Poor: To teach the criteria for a balanced diet in the preparation of a meal or menu.

   Better: To apply four criteria for a balanced diet in the preparation of a meal or menu.

3. Relevant: The objective must call for student behavior which makes some difference. The number of instructional objectives is theoretically infinite. Therefore, selectivity must be based on some social demand, student need, or philosophical imperative.

*The phrase, "The Student will be able..." is understood to precede each objective written for a CBRU.

Poor: To memorize the trigonometric tables.

Better: To use the trigonometric tables to determine mathematical relationships.

Poor: To describe ten different types of abodes -- pueblos, igloos, castles, etc.

Better: To explain the geographical and environmental factors which account for mans' choices of housing.

4. Observable: The objectives must call for behavior which can be evaluated. If objectives chosen were not observable, it would be irrelevant for evaluating student progress of identifying future goals. This criterion should also provide for the consideration of a wide range of measuring devices; especially those which do not involve the usual pencil and paper test.

Poor: To appreciate the reasons why barter is obsolete.

Better: To analyze the reasons why barter is no longer feasible in our economy.

Poor: To value the democratic process.

Better: To value the democratic process by using compromise as a means for problem solving.

5. Single Factor: The objective must call for a single behavior in order to minimize confusion in the evaluation procedure. If more than one behavior is called for, then more than one interpretation will be possible for the evaluation of the objective.

Poor: To list and define the requirements of effective communication.

Better: To list the requirements for effective communication.

6. Flexible: If the objective is too specific, the Content, Activities, Materials, and Measuring Devices for use with that objective will be severely limited and will not permit the modification of approaches necessary for accomodating individual differences in students.

Poor: To write the eight meanings of the word "power" as explained in Webster's Eighth New Collegiate Dictionary.

Better: To analyze the ways in which the word "power" may be used.

The criteria just listed represent an ideal situation which, given the state of the art, we can only approach. To arrive at the statement of an objective which is absolutely behavioral, relevant, easily observable, and simultaneously allows the flexibility required for individualizing instruction, is, in most cases, extremely difficult. However, if these guidelines are kept in mind while writing, and if they are consistenly applied, the resulting objectives should be extremely useful in developing computerized units and in planning teaching-learning experiences which will facilitate the individualization of instruction.

C. Prevalent Types: Educational objectives are often divided into three categories: Cognitive, Affective, and Psychomotor. For our purposes, this division is academic except as it applies to a condition which has been demonstrated in the process of developing previous CBRU's. The vast majority of objectives which have been formulated for CBRU's would be classified as cognitive. The use of cognitive objectives has developed as a result of the position contemporary education has taken to desparage the vague approach to objective writing. Affective objectives generally fall into this category because the evaluative criteria for such objectives are extremely difficult to define, implement, and measure. Therefore, in preparing objectives in the affective domain, the writer must also include a description of student behavior which can be used as acceptable evidence of an internalized affective change.

D. Language Level: An additional consideration might be the level of language utilized in writing objectives. Since most teachers using CBRU's may want to involve the students of various grade levels in the consideration and selection of instructional objectives, it is a good practice to avoid excessively sophisticated, complex or esoteric terminology when formulating instructional objectives. On the other hand, clarity of an objective should not be sacrificed for the sake of brevity.

E. Complexity of Objectives: Bloom & Krathwahl's classfiication of educational objectives (Knowledge, Comprehension, Application, Analysis, Synthesis and Evaluation) has been utilized as a convenient method for determining the extent to which persons who are formulating instructional objectives have effected a reasonable balance between those which are quite simple and those which are relatively complex. It should be noted, however, that this does not imply that a certain predetermined number of objectives should be written for each of Bloom & Krathwahl's classifications, but by classifying the objectives, problems of imbalance can be identified and ameliorated. In the past, for example, it was noted that a disproportionately high number of Classification I (Knowledge) objectives were being written, while Classification III (Application) objectives were virtually non-existent. Subsequently, this condition has been remedied to some extent.

II. DESIGNATING CONTENT (SUBJECT MATTER)

Content (subject matter) is informational data; the facts, statistics, generizations, concepts, and definitions which will facilitate the achievement of a particular objective.

Content, in the CBRU concept, is relegated to its proper role, i.e., the informational means for achieving an objective, and not the end result itself. In other words, in order to achieve some objectives, a student must have at his disposal, certain concrete cognitive data: facts, statistics, generalizations, etc., related to that objective. Content consists of such information.

Unlike the other components of CBRU's -- Objectives, Activities, Materials, Measuring Devices -- the critical consideration in writing content items is selectivity. Theoretically, the number of content items which can be written for any topic is infinite. Therefore, careful consideration must be given to the number of content items which will be written, their format, and their scope.

Following are the general guidelines which should be considered when writing content items.

1. It should be initially noted that the content component of CBRU's is designed primarily for use by the teacher rather for the the individual student, in that it serves to provide the teacher with a general inventory of some of the basic facts, statistics, and generalizations related to the unit topic. Content acquisition for the student, however, should not be via a pre-determined listing of facts and concepts, but should accrue as a result of one's interaction with pertinent materials and activities. Since content is primarily a teacher resource, each item should be more than a simplistic one line statement which denotes an obvious fact. Rather it should be a comprehensive statement which may include a useful concept, a stimulating thought, or a provocative statistic.

2. Content items should be written with a general grade level range in mind. If the unit under consideration is designated Grades 4-6, the complexity or sophistication of the content item should probably fall within the application and relevance range of students from Grades 2-8. This would allow for exceptional classes at either extreme.

3. Generally speaking, content items which are written as statements or generalizations seem to be the most useful. There is no specific rule which determines how to write the content item, but the complexity of the objective will often provide the necessary clues. If, for example, an objective is quite simple, definitive and limited in scope (to list the differences between stimulants and depressants), the content items would be similarily limited and rather specific. On the other hand, a complex objective (to evaluate the effectiveness of existing drug withdrawal programs), will accommodate a wider range of content which might include generalizations as well as specific statements.

III. DESIGNATING MATERIALS AND ACTIVITIES

A. Once an objective and related content have been written, the means -- the "how" -- whereby one is to be exposed to this content, must be determined. This is accomplished through the use of materials and activities. While materials and activities appear to serve the same function, they differ in the sense that activities are "experiences" while materials are "sources". Even this differentiation can be disputed and the tendency might be to classify activities and materials under one heading. For the purpose of developing Computer Based Resource Units, however, activities and materials will be classified separately. The reasons for this separate classification are varied, but presently, it is sufficient to note that by separating activities and materials, the student and teacher will receive a less complex Computer Based Resource Guide, resulting in easier interpretation, analysis, and utilization.

B. Guidelines for specifying Materials.

1. Materials include books, booklets, pamphlets, audio-aids, audio-tapes, film strips, simulation games, and invited persons, etc. The tendency to overemphasize printed material to the exclusion of a wide variety of other viable sources should be avoided.

2. Materials listed should be relevant to some segment of the student population designated in the unit. Esoteric treatises and doctoral studies, for example, would not be included in a K-6 unit, and probably not even in a 7-12 unit. At the other extreme, a film entitled "The Fireman is Your Friend", would probably be ignored by teacher and student alike in a senior high school.

3. Indiscriminate lists of materials should be avoided. If the teacher, in his professional opinion, deems a material totally ineffective, it should not be listed. The fact that a material did not work for one particular classroom, however, might not be a sufficient criterion for exclusion.

4. If the materials being considered are out of print, dated, difficult to obtain, or difficult to visit, careful reflection should precede the decision to include them.

5. Materials should be listed in the following way:

a. The type of material -- book, chart, filmstrip, etc.

b. Citation should be taken from the title page and should include;

1. Author, editor, or Corporate Name (If joint responsibility, please note joint author, editor, etc.)

2. Actual title of the material
3. Edition note (If more than one edition, please note edition used)
4. Place of publication, publisher's name, date of publication or copyright date
5. Paging or volume numbering, size - if unusual, illustrative information - if important
6. Series
7. Cost of the material - note if material is free

Whenever possible, specify those segments of the material which are pretinent to the Objective. A complete book should not be recommended if only one or two chapters are pertinent. Equally undesirable is the listing of isolated sentences or paragraphs which, if read in isolation might be meaningless or confusing.

C. Citations for periodicals should include:
Author, Title of article (in " "s), Title of periodical, Volume number, pages, month, year.

D. Citations for non-book materials should include:
1. Author (if none use vendor)
2. Actual title of the material
3. Vendor
4. Copyright date (if none use n.d.)

If possible, please include this information:

5. Charts, maps, pictures, slides: number, size, color or b/w
6. Films: millimeters, running time, color or b/w
7. Filmstrips or Filmslides: Number of frames, color or b/w
8. Film loops: standard or super, color or b/w
9. Study prints, flash cards, games, models, specimens, and program learning kits: short statement of what material consists of
10. Phonodiscs: number of discs, diameter in inches, rpms
11. Tapes or cassettes: number of reels, speed in inches, per second, time in minutes

E. At the end of each material listed, at least two or three sentences should be included to describe the content of that particular material.

Two examples of such annotations follow:

1. Book. Ruben, G.H. and Archer, G.A. "What is a Magnet?" Chicago, Benefic Press, 1961 48 pages, slim hard-back, the "What Is It?" Series $1.50 excellent lay-out, colored pictures and diagrams, simple explanations and directions for experiments includes natural, artificial, temporary, permanent and electro magnets, picture and word dictionary. Excellent teacher resource. Accompanying Filmstrip available.

2. Filmstrips-Record. "Let's Listen" including "Exploring City Sounds", "Cows Don't Say Moo" Chicago, Coronet Films Cat. No. S105, Complete set $15.00. First Filmstrip 55 frames, 9 minutes, Second Filmstrip, 45 frames, 11 minutes 12-inch 33 rpm record American Film Festival Award, Best Filmstrip for primary grades. Trip around farm shows that animal sounds usually can't be written with our alphabet. Trip through city develops listening skills by having children guess source of the sounds. Full color.

G. Guidelines for formulating Activities:

1. Activities should be within the realm of feasibility in terms of performance by students, length of time, cost, and accessibility of materials and facilities.

2. Activities should be written in such a way that the teacher and student have a clear understanding of what is to be accomplished. An activity which states, "interview a drug addict", might be meaningless to a teacher or student unless it provides some supplementary information concerning possible questions to be asked, experiences to consider, and follow-up activities.

3. For purposes of clarification, a basic title such as: field trip, debate, role play, bulletin board, etc. should precede the actual description of the activity where appropriate.

4. Be aware of the virtual endless variety of stimulating instructional activities which can be formulated by a teacher with sufficient experience and a fertile imagination. No matter how well formulated the instructional objective is, the means for achieving that objective -- the activity -- must be interesting, exciting, and relevant enough to encourage a student to pursue it.

5. Developing activities involves the consideration of a wide variety of approaches and contexts. Activities involve a variety of possible approaches which should be considered. There must be activities for large groups, small groups and individual students. Further, activities can be introductory (highly motivational), developmental (directly related to the objective), or culminating (practicing what has been learned). This is not to say that each activity can only fit into one of these categories. Indeed, in many cases an activity can be considered appropriate for an individual student and small group as well; or it can be properly used in an introductory and developmental capacity. The important consideration concerns the need to include a wide variety of interesting activities which will accommodate all of the approaches mentioned above.

6. Whenever possible, instructional activities should:

   a. Allow the student some decision making alternatives rather than assigning him a specific task.

b. Place the student in an active rather than a passive role.

c. Cause students to be involved in real situations rather than fabricated activities which have no value or applicability outside of the classroom.

d. Examples of Activities:

1. Conduct an "anti-smoking" campaign in your school using those media which will be most appropriate for your purposes.

2. In cooperation with a woodworking or shop class, or an interested community group, have the class provide nests, boxes or other havens for birds and mammals to use on a portion of the school property.

3. Using the school building and home as examples, students can describe the things that man has done to alter the natural environment (air conditioning, heating, lighting, construction, etc.). The list may be expanded to changes beyond home and school. Students can react to such questions and concerns such as:
   - Are these alterations beneficial to humans?
   - What indirect or long-range consequences have we caused to take place?
   - What are some of our plans for the future which require manipulation to the environment?
   - Can we completely control our environment? Should we? Why or why not?

IV. FORMULATING MEASURING DEVICES

A. One of the most consistently valid determiners of the quality of a Computer Based Resource Unit has been the extent to which the measuring devices have been, 1) imaginative, 2) varied in terms of approach and sophistication, and 3) possessed of sufficient criteria for determining how and whether the objective has been achieved.

B. Guidelines for Developing Measuring Devices:

1. Imaginative: Ideally, any list of evaluation devices should include all of the possibilities available to teachers. Too often and too easily, however, paper and pencil objective tests are the only type considered. Without disparaging paper and pencil objective tests, it seems reasonable to assume that a wide variety of other testing techniques should be available for the creative teacher who wishes to individualize instruction. Additionally, a source of varied measuring devices might serve to stimulate the less imaginative teacher.

   Essays, rating scales, oral questioning, log diaries, checklists, anecdotal records, role playing, original productions, etc., are just a few of the possible instruments which can be utilized to determine the extent to which an objective has been achieved.

Of course, most of the above examples are surrogate standards for the "real" world. The ideal evaluation device is one which allows the learner to apply his newly acquired knowledge and/or skill toward the solution of an actual problem, or the creation of a useful product. For example, the best way to evaluate a student's ability to make a high quality coffee table is to have him make a coffee table and attempt to sell it. Or, an objective which requires that a student concern himself with techniques for influencing legislation on a local level, could be ultimately concluded by having the student or students device and implement a plan for proposing a town law.

Some subject areas and some objectives naturally lend themselves better to this concept of evaluation than others. Additionally, such evaluative devices are often difficult to consider in terms of time and complexity. But it is this concept of evaluation which should be carefully considered and, whenever feasible, utilized, along with some of the more common forms of testing.

2. Varied: A description of a varied approach would include some of the elements of Item #1. Additionally, however, a varied approach implies that one particular objective may be amenable to a variety of evaluative techniques, rather than simply one.

   Further, the achievement of a single objective can be measured at various levels of sophistication. Although two students may be concerned with the same objective, their individual intellectual aptitudes may vary greatly. Whenever possible, therefore, evaluation devices which coincide with a variety of aptitudes should be considered.

3. Achievement Criteria: It is not rare that an activity can be interchanged with a measuring device. To "give an oral report to the class discussing some of the characteristics exhibited by a drug attict," might serve equally well as an activity or as a measuring device. It would be a better measuring device, however, if the unit writer would include -- among other things -- the following: "This report should include at least one psychological, sociological, and physiological characteristic."

   When writing a measuring device which includes some achievement criteria, the question of specificity is important. To what extent should a unit writer literally "write out" the complete evaluation device, question by question? Often this type of specificity is impractical, unnecessary, and difficult to achieve. The unit writer must, therefore, search out the "happy medium" between measuring devices which are so vague that they probably provide nothing of value to the classroom teacher, and those which are so specific and detailed that they are impractical for use in a CBRU in terms of length.

   One approach is to specify the type of evaluation device to be used; give adequate direction for its administration; and give several illustrative examples of the items to be used.

Often standard exams are available which are excellent measuring devices. In these cases, the unit writer should briefly explain the purpose of the exam and note its source.

At this point in the progress of CBRU's, there is no doubt that the formulation of meaningful, imaginative, relevant, varied and realistic evaluation devices is the most formidable challenge for unit writers.

V. SEQUENCE FOR PREPARATION OF COMPONENTS

Although these guidelines described the preparation of content, materials, activities, and measuring devices in that order, the sequence in which the components should be developed is not necessarily the same. Indeed, experience has shown that once objectives have been formulated, the developmental sequence of the remaining components have varied depending upon the particular group involved.

GUIDELINES FOR CODING COMPONENTS TO OBJECTIVES

The Objectives specified in a unit of instruction are achieved, in part, by the effective utilization of subject matter (Content), Activities, and Materials and the use of Measuring Devices to assess that achievement. The computer can assist the teacher in organizing these components and increase his accuracy and efficiency in decision-making. By sorting data on the basis of desired learning outcomes and instructional variables, the computer can provide the teacher with suggestions which are of optimal utility for his particular class. This is accomplished through the coding process described here.

Each Objective, Content Item, Activity, Material and Measuring Device developed for a CBRU must have a unique identification number. That is, Objectives are numbered consecutively from 1, Content Items are consecutively numbered from 1, and so forth for Activities, Materials and Measuring Devices. These unique numbers are the data "read" by the computer, thus omissions or duplications will result in no output or even worse, inaccurate output.

Each statement (except Objectives) must be coded twice; once to Objectives and, once to Variables (Objectives are not coded to Objectives). Following are the directions for this essential process.

CODING COMPONENTS TO OBJECTIVES

Procedures for filling in coding forms (see Appendix 1)

1. Write in the title of the Unit.
2. Write in the number of the Unit.
3. Note the category Content, Activities, Materials, Measuring Devices and write it in below the word "Category".
4. Place a circle around the word "Objectives" to indicate that items on this form are being coded to "Objectives".
5. Refer to the "Variables" sheet which is appropriate to the category you are coding.
6. Study the particular category statement and determine which variables are appropriate for the particular statement.
7. Note the number of the variables.

   Ex: (refer to sample coding form)
   Activity number 1 is apparently related to variables number 9, 13, 41, 65, ... 258. Activity number 4 is coded to a large number of variables; therefore the variables were continued on the next line.
8. Study the particular statement and determine to which Objectives it is related.
9. Write in the number of each Objective to which the statement is related.
10. Begin coding the next statement on the next empty line.

NOTE:

Coding of Specific Content Item, Activities, etc., to more than 15 to 20% of the Objectives of a given unit can result in excessive repetition in the guide received by a classroom teacher.

GUIDELINES FOR CODING COMPONENTS TO VARIABLES

In preparing instructional material for computer retrieval, i.e., Computer Based Resource Units, it is necessary to indicate those student or instructional characteristics which are most closely related to each Objective, Content Item, Activity, Material and Measuring Device. That is, given a list of instructional Activities, a coder must determine which "interest" areas, or "instructional" groupings", or "mental ages", for example, are most closely related to each Activity. This coding, therefore, serves as a screen by limiting the number of suggestions a student will receive, this limitation being based upon those unique characteristics of each student.

Without this coding procedure, every student would receive all Activities and all Materials related to a particular Objective. Under such circumstances, there would be no individualization of instruction and there would be no need to utilize a computer

The coder, therefore, has the extremely vital responsibility for carefully analyzing each Objective, Content Item, Activity, Material and Measuring Device, and then coding each item to its appropriate characteristics (variables).

This operation is both mechanical and intellectual - mechanical in the sense that the coder must follow a procedure which involves the listing of numbers on coding sheets; intellectual in the sense that the coder must make intelligent, professional decisions concerning the relationships between individual student characteristics and Activities, Measuring Devices, etc. This operation is so critical that despite the high caliber of material which has been written for various Units, less than high quality Computer Based Resource Guides have been generated because of some questionable coding procedures.

In strict operational terms, coders must adhere to th following procedures:

1. Given a list of instructional Activities, for example, related to a particular Unit, the coder - using a coding sheet (Appendix #1) - will first indicate the Unit title, and the Unit number in the appropriate place.

2. The coder will then indicate that he is coding "Activities" to variables by writing this term below the heading CATEGORY.

3. Each "Activity" for a given Unit has been assigned a number. The coder will note this number on his coding sheet in the left hand column and then proceed to indicate the numbers of variables which are related to that particular "Activity".

4. Since each of the components - Objectives, Content Items, Activities, Materials, Measuring Devices, - is distinctive in terms of its application to a teaching-learning process, the variables to which it will be coded will differ in some respects. That is, while a Material such as a book can be coded to reading level, it would be virtually impossible to code a Content Item to a reading level, and it would be educationally meaningless as well. The coder, therefore, will address himself to a different list of variables for each of the components. (See Appendix #2)

Coding Components To Variables

Procedures for filling in coding forms

1. Write in the title of the unit.
2. Write in the number of the unit.
3. Note the category Objectives, Content, Activities, Materials, Measuring Devices, and write it in below the word "Category". (NOTE: only one "Category" can appear on any single page.)
4. Place a circle around the word "Variables" to indicate that items on this form are being coded to "variables".
5. In the "Category" column, write in the identification number of the statement you will be coding.
6. Determining the catagories to which this item will be coded by referring to Appendix 2.
7. Refer to the "Variables" sheet which is appropriate for the type of item you are coding.
8. Study the particular statement and determine to which variables it is related.
9. Write in all the variable numbers appropriate to that statement using more than one line if necessary. (NOTE: where an item is coded to a range of variables, e.g. Mental Age 203 to 207, an arrow may be used to designate the range.)
10. Begin coding the next statement on the next empty line.

VARIABLES CATEGORIES

1. Student Interests (Number 1 on Appendix 3): There are more than thirty student interests to which the components - Objectives, Content Items, Activities, Materials and Measuring Devices - can be coded. Most of them are quite specific while others

are vague and may be subject to misinterpretation. This condition exists since we are presently at the stage where experimentation with definitive terminology for student interests is still being analyzed.

For the coder, this means that ascertaining which student interests apply to certain components is not a simple "yes or no" process. For example, an Activity which states, "From the radio and television programs listed in the daily paper, make a list of the different types of entertainment and informational services offered", can conceivably be coded to the following student interests: sports/recreation, communication, psychology, education, sociology/family living, performing arts. Rationale for each of these student interests can be logically explicated even though there will probably never be 100% agreement among a group of teachers. Since this coding procedure is intellectually demanding, the following guidelines may be helpful:

a. Hopefully, any component should be coded to more than one student interest; the median seems to be five or six although certain activities which are quite comprehensive in nature have been coded to many more.

b. The decision as to whether a particular student interest should be coded to a statement should be based upon the coder's best intuitive and intellectual judgment. In other words, the coder will ask, "Would a student who is interested in anthropology profit from this particular Activity (or Content Item, or Material, or Measuring Device?) If the answer is yes, then anthropology should be coded to the Activity. If the answer is "51% yes as opposed to 49% no", the item should still be coded. Most decisions will enter into this "grey area" and then one's best judgment must prevail.

2. Sex (4): Some statements (i.e., Activities, Materials) may be more appropriate for one sex than another (our apologies to members of the women's liberation movement). If this is indeed the case, make the distinction by indicating only one variable in this category. If the statement has equal validity for both sexes, include both variable numbers.

3. Developmental Tasks (5): Developmental Tasks are somewhat chronological in nature. That is, developmental tasks in the 70's are more related to elementary school children whereas the high 80's and 90's items deal more so with high school students. The purpose of including this catagory of variables is to identify Activities and Materials which not only facilitate achievement of objectives related to the Unit topic but are also helpful in developing these critical skills. Designate all Developmental Tasks which are appropriate for each statement even if the range spans both elementary and secondary classifications. If none apply, ignore the entire catagory.

4. Major Social Functions (6): These variables represent those societal conditions in which all individuals must participate at sometime in their lives. Many concepts (Content Items, Activities, Materials) clearly fall into one or more of these catagories. By indicating as many variables to which a statement is related, the computer will be able to generate suggestions related to only those concerns identified by a teacher/user.

5. Reading Level (7): In the same way that Chronological and Mental Age are coded in ranges of numbers rather than by designating one distinct number, reading level is more appropriately coded in terms of a range of grade levels rather than one. Determination of reading level is best accomplished through the use of a reading formula for determining grade level. Many such formulas are available. Some are quite easy to apply while others involve detailed analysis of eight or ten excerpts from the material. Some publishers indicate the reading level of their books and others will note ranges such as junior high, senior high, etc. Hopefully, where possible, coders will attempt to apply some objective criteria in determining grade level other than simply estimating.

6. Instructional Activity (8): This category serves to describe all Activities in a Computer Based Resource Unit. Often an Activity must be described by more than one variable. For example - "The student will construct a map of the United States out of construction paper. The variety of geographic regions (deserts, mountains, forests) should be labelled by picture postcards. The student can explain to his classmates, the various climates indigenous to each region" - could be coded as verbal, speaking, constructing/creating, and student led discussion. (NOTE: Non-verbal (124) indicates that the use of language is not necessary for completing a specific Activity.)

7. Suggested Approach (9): An Activity may be appropriate to more than one variable in this catagory. An activity described as extra-curricular (142) indicates that the student will be utilizing resources and following strategies not typically associated with the classroom environment.

8. Objective Types (10): The variables in this category designate the relative sophistication of a specific Objective as described by Bloom and Krathwohl.* A discussion of this classification scheme would be too lengthy for this document; therefore, the citation noted is recommended. Experience in developing Computer Based Resource Units has shown that specifying objectives at the lower levels of the taxonomy has resulted in severe restrictions on variability of approaches in achieving those Objectives.

9. Material Descriptor (11): The combination of variables in this category should be sufficient for describing almost any instructional material. More specific terminology is not used since it most naturally would be these characteristics of a material that would cause a teacher to make selections for classroom use and a list of specific instructional materials is virtually infinite.

10. Instructional Grouping (13): The major consideration for coding an Activity to variables in this catagory is to select the one designation which would provide the most effective environment for learning. Designating more than one mode of learning on a frequent basis results in a great deal of repetition for the teacher/user.

11. Evaluation Devices (14): Generally, most Evaluation Devices will be adequately described by one or more of the variables listed in this catagory. Detailed explainations of each variable is not possible in this document; however, much has been written in other sources to further clarify these descriptions. The Unit writer might also use this listing as a source of ideas for writing a variety of Evaluation Devices for specified Objectives.

12. Mental Age (15) and Chronological Age (16): In many respects, the consideration of Mental Age and Chronological Age must occur simultaneously. If a component seems to be apropos for a 6th grader of average intelligence then a Mental Age of 11 and a Chronological Age of 11 could be noted.

For purposes of convenience and necessary reflection, however, these two catagories will usually be considered separately. Following are guidelines for considering the coding of components to Mental Age and Chronological Age:

a. The coding for Mental Age and Chronological Age always involves a range of variables. That is, it is probably impossible to devise an activity or material which would be apropos for only one Mental Age and one Chronological Age.

*Bloom, Benjamin, et. al., Taxonomy of Education Objectives, David McKay Co., New York, 1956.

b. It would seem easier to commence with Mental Age, starting with the lowest possible level for the category. The coder might ask himself, "What is the lowest Mental Age where a particular component is intellectually comprehensible to the student?" In other words, what is the lowest Mental Age where this concept, activity or material can be understood or undertaken. The same question cannot be asked for determining the highest Mental Age since it follows that any Mental Age above the lowest would be appropriate. The upper limit of the Mental Age range designation sh uld be determined by the level at which the statement would appear to be too trite, simple or ineffective.

c. Coding to Chronological Age should begin with a consideration of a statement in terms of its social appropriateness. There might be an item which is intellectually comprehensible to a student with a Mental Age of 6 years. This same item might not be socially or psychologically desirable for a student with a Chronological Age of 11. Therefore, this item might be coded to Mental Age ranging from 6 to 12, and the Chronological Age might range from age 6 or 7 to 10. Occasionally some coders find it convenient to convert Mental Age and Chronological Age to grade level designation.

Another approach is to consider the Chronological Age of a component in terms of its social appropriateness and then consider the I.Q. of the student. This will then provide clues for determining Mental Age. For example, a material which seems to be apropos for an average 6th grader would imply a Chronological Age of 11. If the coder concludes that a 6th grader with an I.Q. of 80 would also find this material appropriate, he can then designate a Mental Age of approximately 8 or 9. The coder can then consider an average 5th grader, and go on.

13. Physical Handicaps (17): This category of variables should be considered in the following context: "Will a student with this handicap benefit from this Activity, Material, or Measuring Device?" Since many instructional materials are available in braille or some other specialized vehicle, the Unit writer should search out such information and make sure that the information is included in the Material annotation and coded appropriately.

14. Learning Environment (20): This category is self-explanatory. More than one designation can be used to describe an Activity which utilizes more than one environment. NOTE: Since field trip Activities should also include follow-up classroom activities, they should be coded to both classroom (258) and outdoors (259).

APPENDIX 1

Coding Sheet for

Objectives

UNIT NUMBER 017

CATEGORY Activities	OBJECTIVES				VARIABLES					
124	5	6	12	23						
125	9	14								
126	1	3	18							
127	9									

APPENDIX 2

Appropriate Categories

For

Coding Components

APPROPRIATE CATEGORIES FOR CODING COMPONENTS

OBJECTIVES should be coded to the following variables categories:

1. Student Interests
4. Sex
5. Developmental Tasks
6. Major Social Functions
10. Objectives
15. Mental Age
16. Chronological Age

CONTENT should be coded to the following variables categories:

1. Student Interests
4. Sex
5. Developmental Tasks
6. Major Social Functions
15. Mental Age

ACTIVITIES should be coded to the following variables categories:

1. Student Interests
4. Sex
5. Developmental Tasks
6. Major Social Functions
7. Reading Level (if appropriate)
8. Instructional Activity
9. Suggested Approach
13. Instructional Grouping (one only whenever possible)
15. Mental Age
16. Chronological Age
17. Physical Handicaps
20. Learning Environment

MATERIALS should be coded to the following variables categories:

1. Student Interests
4. Sex
5. Developmental Tasks
6. Major Social Functions
7. Reading Level (if appropriate)
11. Material Description
15. Mental Age
16. Chronological Age
17. Physical Handicaps

MEASURING DEVICES should be coded to the following variables categories:

1. Student Interests
4. Sex
5. Developmental Tasks
6. Major Social Functions
7. Reading Level (if appropriate)
13. Instructional Grouping (one only whenever possible)
14. Evaluation Devices
15. Mental Age
16. Chronological Age
17. Physical Handicaps
20. Learning Environment

APPENDIX 3

Instructional Variables

INSTRUCTIONAL VARIABLES

1. STUDENT INTERESTS

1. Agriculture
2. Anthropology
3. Astronomy
4. Biography/Autobiography
5. Biology
6. Botany/Zoology
7. Business
8. Chemistry
9. Communication
10. Earth Science/Geography
11. Fine Arts/Crafts
12. Foreign Cultures/Languages
13. Folklore/Customs
14. History
15. Home Economics
16. Mathematics
17. Philosophy/Ethics
18. Physics
19. Political Science/Law
20. Psychology
21. Religion
22. Economics
23. Education
24. Engineering/Technology
25. Fiction/Mythology
26. Sociology/Family Living
27. Sports/Recreation
28. Transportation
29. Performing Arts
30. Medicine/Health
31. Adventure
32. Poetry
33. Creative Writing

4. SEX

72. Male
73. Female

5. DEVELOPMENTAL TASKS

A. Middle Childhood

74. Learning Physical Skills Necessary for Ordinary Games
75. Building Wholesome Attitudes Toward Oneself as a Growing Organism
76. Learning to Get Along With Age-Mates
77. Learning An Appropriate Masculine or Feminine Social Role
78. Developing Fundamental Skills in Reading, Writing, and Calculating
79. Developing Concepts Necessary for Everyday Living
80. Developing Conscience, Morality, and a System of Values
81. Achieving Personal Independence
82. Developing Attitudes Toward Social Groups and Institutions

B. Adolescent

83. Accepting New and More Mature Relations With Age-Mates of Both Sexes
84. Accepting One's Physique (Male and Female Role)
85. Achieving Emotional Independence from Parents and Other Adults
86. Achieving Assurances of Economic Independence
87. Selecting and Preparing for an Occupation
88. Developing Intellectual Skills and Concepts Necessary for Civic Competence
89. Desiring and Achieving Socially Responsible Behavior
90. Preparing for Marriage and Family Life
91. Acquiring a Set of Values and Ethical System as a Guide to Behavior

6. MAJOR SOCIAL FUNCTION

92. Governing
93. Communicating
94. Transporting
95. Producing
96. Consuming and Conserving
97. Heritage
98. Cooperating
99. Leisure
100. Earning a Living
101. Educating
102. Spir tual/Moral

7. READING LEVEL (RELATIVE TO GRADE LEVEL)

103. Non-Reader
104. Pre-Primer
105. Primer
106. 1
107. 1.5
108. 2
109. 2.5
110. 3
111. 4
112. 5
113. 6
114. 7
115. 8
116. 9
117. 10
118. 11
119. 12
120. Above 12

8. INSTRUCTIONAL ACTIVITY

121. Teacher Activity
122. Dramatization
123. Verbal
124. Non-Verbal
125. Problem Solving
126. Reading
127. Field Trips
128. Writing
129. Listening
130. Speaking
131. Constructing/Creating
132. Laboratory
133. Drill Practice
134. Physical/Tactile
135. Lecture
136. Teacher Led Discussion
137. Student Led Discussion
138. Recitation

9. SUGGESTED APPROACH

139. Introductory Activity
140. Developmental Activity
141. Culminating Activity
142. Extra-Curricular

10. OBJECTIVE TYPES

143. Knowledge
144. Comprehension
145. Application
146. Analysis
147. Synthesis
148. Evaluation
149. Receiving
150. Responding
151. Valuing
152. Organization
153. Characterization by a Value
154. Psychomotor

11. MATERIAL DESCRIPTOR

155. Audio
156. Visual
157. Audio-Visual
158. Verbal
159. Non-Verbal
160. Printed
161. Programmed Instruction
162. 3-D Material/Laboratory
163. Resource/Places/People
173. Bulletin Board Materials

13. INSTRUCTIONAL GROUPING

182. Individual Activity
183. Small Group Activity
184. Large Group Activity

14. EVALUATION DEVICES

185. Standardized Test
187. Paper/Pencil Objective
189. Checklist
186. Paper/Pencil Essay
188. Rating Scale
190. Log/Diary

15. MENTAL AGE

194. .5
195. 1.0
196. 1.5
197. 2.0
198. 2.5
199. 3.0
200. 3.5
201. 4.0
202. 5.0
203. 6.0
204. 7.0
205. 8.0
206. 9.0
207. 10.0
208. 11.0
209. 12.0
210. 13.0
211. 14.0
212. 15.0
213. 16.0
214. 17.0
215. 18.0
216. 19.0
217. 20.0
218. Above 20.0

16. CHRONOLOGICAL AGE

219. 0.5
220. 1.0
221. 1.5
222. 2.0
223. 2.5
224. 3.0
225. 4.0
226. 5.0
227. 6.0
228. 7.0
229. 8.0
230. 9.0
231. 10.0
232. 11.0
233. 12.0
234. 13.0
235. 14.0
236. 15.0
237. 16.0
238. 17.0
239. 18.0
240. 19.0
241. 20.0
242. 21.0

17. PHYSICAL HANDICAPS

243. Blind
244. Partially Sighted
245. Deaf
246. Hard of Hearing
247. Gross Motor Disability
248. Fine Motor Disability

20. LEARNING ENVIRONMENT

258. Classroom
259. Outdoors
260. Gymnasium

APPENDIX 4

Coding Sheet for Variables

UNIT TITLE Communication

UNIT NUMBER 017

CATEGORY Activities	OBJECTIVES — VARIABLES									
124	9	20	23	26	27	29	72	73	78	79
	82	93	99	101	111→	→120	123	126	128	139
	140	182	204→	→213	229→	→237	243	244	245	246
	248	258								
125	9	18	24	27	72	78	93	95	99	115→
	120	123	130	131	134	137	141	182	207→	→215
	231→	→242	245	246	258					

APPENDIX B

SAMPLE - EDITED AND UNEDITED INSTRUCTIONAL OBJECTIVES

General Overview

4. To define measurement as approximation.

5. To list the standard units of measure.

6. To use the concept of significant digits to round off numbers.

7. To give interpretation of the term measurement.

13. To explain the concept of error of measurement.

14. To estimate using standard units of measure.

27. To compare the Metric and English systems.

100. To define the term ratio as it is related to the idea of scale drawing.

102. To give your interpretation of scale drawing.

144. To analyze inequalities, equalities and "betweeness" among differing measures.

Linear Measurement

1. To develop an original system of linear measurement.

2. To outline the historical origin of linear measurement.

3. To compare the standard inch, (foot, yard) with the inch (foot, yard) as defined in the historical sense.

9. To demonstrate the concept of length through comparisons of various objects.

10. To describe the instruments used in linear measurement.

11. To use linear measuring devices accurately.

15. To name the dimensions of various plane figures.

16. To demonstrate skill in determining the perimeter of various plane figures in standard units of measure.

17. To measure circumference and diameter of various figures in standard units of measure.

30. To identify differences in area through comparisons of various figures.

32. To define the terms used in the measurement of area.

33. To extend the principle of area measurement of odd shaped figures.

34. To derive independently a formula for determining area.

35. To recognize common plane figures.

37. To measure area of various plane figures in standard units.

41. To derive square measure from linear measure.

86. To develop an original unit for angular measurement.

88. To trace the development which led to units of angular measurement based on the circle.

90. To measure angles using a protractor.

91. To use a compass in measuring circles.

95. To demonstrate angular measurement through comparison.

93. To measure distances on maps through scale drawings.

101. To use a scale to develop further understanding of length.

Non-Linear Measurement

45. To demonstrate the concept of volume through comparisons of various objects.

46. To recognize common solid figures.

47. To use the cube as a unit for volume.

50. To derive a formula for determining volume.

51. To state the accepted formula for determining volume.

52. To measure volume of various solid figures.

55. To list the units of dry measure in standard units.

56. To analyze the uses of liquid measure and dry measure to measure capacity.

57. To list the units of liquid measure in standard units.

58. To compare the relationship between dry weight and liquid weight measurement in standard units.

64. To outline the historical origin of the balance and weights system.

65. To list the uses of the terms "avoirdupois," "apothecary," and "troy".

80. To define latitude and longitude.

Measuring Time

68. To outline the historical measurement of time.

70. To list the standard units used to measure time.

71. To define the units of time in an astronomical sense.

72. To compare various units of time.

74. To compare the development of various types of calendars.

75. To trace the derivation of names of the days of the week.

76. To compare various types of clocks.

77. To list the time zones used in the United States.

78. To define the term time zone.

Measuring Heat

108. To read the Fahrenheit scale.

109. To read the Centigrade (celsius) scale.

110. To read the Kelvin (absolute) scale.

112. To develop an original scale to measure heat.

113. To describe the relationship between the Centigrade and Fahrenheit scales.

114. To describe the relationship between Fahrenheit, Centigrade, Kelvin scales.

The Metric System

23. To accurately use the meter stick in measuring various objects.

24. To estimate the linear dimensions of common objects, using the metric unit of measure.

25. To determine the parimeter of various plane figures in metric units of measure.

26. To determine circumference of various plane figures in metric units of measure.

27. To compare the Metric and English systems.

28. To determine the parimeter of various plane figures in both Standard and Metric Units.

29. To determine circumference of various plane figures in both the Standard and Metric Units.

38. To measure area of various plane figures in metric units.

39. To measure area of various plane figures in both metric and standard units.

42. To derive square measure from linear measures in the Metric System.

53. To measure volume of various solid figures in metric units.

54. To measure volume of various solid figures in both metric and standard units.

59. To list the units of dry measure in metric units.

60. To list the units of liquid measure in metric units.

61. To compare the relationship between dry weight and liquid weight measurement in metric units.

Miscellaneous

127. To name the units of force.

129. To explain the range of a decibel unit.

130. To measure sound.

137. To measure electricity.

138. To list the terms used in nautical measure.

139. To trace the origin of nautical measurement.

140. To compare nautical units of measure with statute units of measure.

142. To analyze the relationship between light years and miles.

148. To define clothing sizes in terms of measurement.

MEASUREMENT

OBJECTIVES

COGNITIVE DOMAIN

1.00 KNOWLEDGE

2. To outline the historical origin of linear measurement.

4. To define measurement as approximation.

5. To list the standard units of measure.

10. To describe the instruments used in linear measurement.

15. To name the dimensions of various plane figures.

19. To trace the historical development of the metric system.

20. To list the units of the metric system in length.

21. To list the units of the metric system in capacity.

22. To list the units of the metric system in weight.

31. To outline the historical origin of area.

32. To define the terms used in the measurement of area.

35. To recognize common plane figures.

36. To identify the more accepted formula for determining area.

44. To list the standard units of cubic measurement in linear system.

46. To recognize common solid figures.

51. To state the accepted formula for determining volume.

55. To list the units of dry measure in standard units.

56. To analyze the uses of liquid measure and dry measure to measure capacity.

57. To list the units of liquid measure in standard units.

59. To list the units of dry measure in metric units.

60. To list the units of liquid measure in metric units.

64. To outline the historical origin of the balance and weights system.

65. To list the uses of the terms "avoirdupois," "apothecary," and "troy."

68. To outline the historical measurement of time.

70. To list the standard units used to measure time.

71. To define the units of time in an astronomical sense.

75. To trace the derivation of names of the days of the week.

77. To list the time zones used in the U.S.

78. To define the term time zone.

80. To define latitude and longitude.

88. To trace the development which led to units of angular measurement based on the circle.

93. To name common geometric angles.

96. To list the units of U.S. currency.
97. To outline the historical origin of the U.S. monetary system.
100. To define the term ratio as it is related to the idea of scale drawing.
103. To trace the historical development of thermometer scales.
104. To define the term temperature as a measure of heat.
105. To explain the uses of various kinds of thermometers.
107. To describe the parts of a glass thermometer.
108. To read the Fahrenheit scale.
109. To read the Centigrade (celsius) scale.
110. To read the Kelvin (absolute) scale.
111. To define the term absolute zero.
119. To define the calorie as a unit of heat.
120. To define the British Thermal Unit.
122. To trace the historical origins of units of force.
123. To trace the historical origins of units of work.
124. To trace the historical origins of units of power.
125. To name the units of work.
126. To name the units of power.
127. To name the units of force.
128. To list the terms used in sound measurement.
129. To explain the range of a decibel unit.
131. To list the terms used in measurement of light.
133. To trace the historical origin of the measurement of light.
134. To list the units of electricity.
136. To state the speed of electricity.
138. To list the terms used in nautical measure.
139. To trace the origin of nautical measurement.
141. To define the light year as a unit of measure for space.
148. To define clothing sizes in terms of measurement.
149. To list the standard units of cubic measurement in the metric system.
150. To trace the historical development of various thermometers.

2.00 COMPREHENSION

13. To formulate the concept of error of measurement.
30. To identify differences in area through comparisons of various figures.
33. To extend the principle of area measurement of odd shaped figures.
40. To interpret the term "area".
41. To derive square measure from linear measure.
42. To derive square measure from linear measure in the Metric System.
43. To describe the "original cubic measurement".
48. To define the "third dimension" used in determining volume.
66. To convert units of weight measure equivalents.
73. To investigate the possibility of a world calendar.
79. To convert from one time zone to another.
84. To convert speed from miles per hour to feet per second.
89. To convert radian measure to degree measure.
142. To analyze the relationship between light years and miles.

3.00 APPLICATION

6. To use the concept of significant digits to round off numbers.
9. To demonstrate the concept of length through comparisons of various objects.
11. To use linear measuring devices accurately.
16. To demonstrate skill in determining the perimeter of various plane figures in standard units of measure.
17. To measure circumference and diameter of various figures in standard units of measure.
18. To determine circumference using a fractional approximation for pi; a decimal approximation for pi.
23. To accurately use the meter stick in measuring various objects.
25. To determine the perimeter of various plane figures in metric units of measure.
26. To determine circumference of various plane figures in metric units of measure.
28. To determine the perimeter of various plane figures in both Standard and Metric units.
29. To determine circumference of various plane figures in both the Standard and Metric units.
37. To measure area of various plane figures in standard units.
38. To measure area of various plane figures in metric units.
39. To measure area of various plane figures in both metric and standard units.

45. To demonstrate the concept of volume through comparisons of various objects.

47. To use the cube as a unit for volume.

52. To measure volume of various solid figures in standard units.

53. To measure volume of various solid figures in metric units.

54. To measure volume of various solid figures in both metric and standard units.

62. To measure the volume of a liquid using metric units.

63. To measure the volume of a gas using metric units.

67. To read meters.

81. To read time schedules.

82. To compute speed by means of distance/time ratio in miles per hour.

83. To read a speedometer.

90. To measure angles using a protractor.

91. To use a compass in measuring circles.

92. To use radian measure for angle measurement.

94. To use degree measurement in angles of navigation.

95. To demonstrate angular measurement through comparison.

98. To measure distances on maps through scale drawings.

101. To use a scale to develop further understanding of length.

115. To convert from one scale of heat measurement to another.

116. To demonstrate some of the various uses of the Fahrenheit scale.

117. To demonstrate some of the various uses of the Centigrade scale.

118. To demonstrate some of the various uses of the Kelvin scale.

130. To measure sound.

132. To measure light.

137. To measure electricity.

145. To extend the use of decimal notation in measure.

146. To practice recording length measurements and communicating the results.

147. To apply the principles of addition, subtraction, multiplication and division to measures of common objects.

4.00 ANALYSIS

3. To compare the standard inch, (foot, yard) with the inch (foot, yard) as defined in the historical sense.

27. To compare the Metric and English systems.

49. To discover that solid figures are made up of layers.

58. To compare the relationship between dry weight and liquid weight measurement in standard units.

61. To compare the relationship between dry weight and liquid weight measurement in metric units.

72. To compare various units of time.

74. To compare the development of various types of calendars.

76. To compare various types of clocks.

113. To describe the relationship between the Centigrade and Fahrenheit.

114. To describe the relationship between Fahrenheit, Centigrade, Kelvin scales.

121. To compare the uses of calories with British Thermal Units as units of heat.

135. To define electricity in terms of the watt.

140. To compare nautical units of measure with statute units of measure.

143. To analyze the relationship among common measures.

144. To analyze inequalities, equalities and "betweeness" among differing measures.

5.00 SYNTHESIS

1. To develop an original system of linear measurement.

7. To give interpretation of the term measurement.

14. To estimate using standard units of measure.

24. To estimate the linear dimensions of common objects, using the metric unit of measure.

34. To derive independently a formula for determining area.

50. To derive a formula for determining volume.

69. To develop an original system of time.

85. To define an angle intuitively.

86. To develop an original unit for angular measurement.

102. To give your interpretation of scale drawing.

106. To give your interpretation of temperature.

112. To develop an original scale to measure heat.

FFECTIVE DOMAIN

87. To be receptive to the idea that a degree is a standard unit of measurement.

8. To value the necessity of having standard unit measure.

12. To value the necessity of precise measurement in mathematics.

OBJECTIVES

9708 GOING TO AND FROM SCHOOL (K-3)

The Daily Trip

8. To list some safety rules related to the use of sidewalks and streets.
9. To explain the function of traffic lights.
11. To explain the dangers of talking with, accepting rides from or accompanying strangers.
12. To explain how to avoid various dangerous situations.
13. To state why a policeman is a friend and helper.
14. To describe the safest and most direct route to school.
15. To explain why it is important to cross streets at customary crossings.
16. To demonstrate how to cooperate with policeman or safety guard when crossing streets.
17. To tell why everyone should look both left and right before crossing "non-stop light" streets.
18. To tell why it is dangerous to play with strange animals.
20. To demonstrate proper behavior while boarding, riding, and leaving a bus.
22. To identify signs necessary for one's safety and protection.
23. To explain why one should avoid playing in the streets.
43. To identify the correct bus to take home.
71. To demonstrate the ability to come and go from school unattended.

We Need To Know

4. To show how to sit, stand and walk correctly.
5. To demonstrate what to do when ill or injured.
6. To specify the location of important places in school such as: principal, nurse, library, etc.
7. To list some rules about appropriate clothing for given situations.
24. To explain why it is sometimes better to walk and not run.
25. To list some rules for bicycle safety.
27. To state one's own name, home address, phone number, teacher's name and school name.
29. To demonstrate ability to make a simple request.
78. To demonstrate proper behavior within the classroom and school building.
79. To list some necessary safety precautions for different weather conditions.
30. To identify and attach meaning to certain everyday printed words and signs, such as: boys, girls, in, out, exit, danger.
35. To demonstrate ability to copy simple words accurately.
36. To demonstrate ability to spell own name and a few words correctly.
42. To demonstrate ability to tell time by the hour.
44. To demonstrate ability to give and/or follow directions.
46. To state why it is important to recognize, understand and respect authority.
65. To identify colors, with emphasis on red, green, and yellow as seen on traffic lights, stop signs, caution signs.
72. To describe what to do if lost.
74. To demonstrate awareness of the words "to the left" and "to the right".
75. To describe the correct way to enter and leave school, where to hang outer clothing and way to enter the classroom.
76. To identify by name and occupation those school and community helpers involved in a child's daily activities.

Not for permanent file; expires 6/30/72

008 GOING TO AND FROM SCHOOL

We Belong

1. To explain how the weather determines what type of clothing should be worn.
2. To explain the importance of coming to school only when in good health.
3. To explain why everyone needs daily exercise for good health.
47. To cite examples of good manners.
48. To demonstrate acceptable ways of expressing one's feelings.
49. To tell why one should avoid physical force against others.
55. To demonstrate some understanding of the time and use of clocks.
56. To identify weather as sunny, cloudy, rainy, hot, warm, cool, cold, windy, snowy.
57. To identify seasonal changes.
58. To demonstrate understanding of day and night.
59. To estimate accurately the time that it takes to get to school.
60. To demonstrate awareness of self in relation to space.
63. To describe something seen on the way to or from school.
70. To demonstrate awareness of the many sights and sounds around us everyday.
73. To explain why we have safety rules and laws.

REVISED OBJECTIVES

Resource Unit: Going To and From School

1. To wear clothing suitable for weather.
2. To come to school when only in good health.
3. To exercise for good health.
4. To sit, stand, and walk tall.
5. To know what to do when ill or injured.
6. To know where the Nurse's office is located.
7. To understand the importance of certain rules about clothing, such as removing wet clothing and wearing appropriate clothing.
8. To practice safety when using sidewalks and streets.
9. To recognize street lights and what they stand for.
10. To associate some words and symbols with danger.
11. To develop awareness that he should not talk with, accept rides from, or accompany strangers.
12. To begin to recognize and avoid danger.
13. To learn that policeman is a friend and helper.
14. To travel directly to school by safest route.
15. To cross streets at customary crossings.
16. To cooperate with policeman or safety guard when crossing streets.
17. To look left and right before crossing "non-stop light" streets.
18. To avoid playing with strange animals.
19. To know how to board and leave bus.
20. To sit properly in seats while riding.
21. To not put head, hand, or arm out window of bus.
22. To learn to recognize signs necessary for his safety and protection.
23. To avoid playing in streets.
24. To learn to walk, not run.
25. To know rules on bicycle safety.

26. To use acceptable behavior on the bus.

27. To recognize and say own name, home address, teacher's name and school name.

28. To recognize some safety signs.

29. To learn to make a simple request.

30. To begin to identify and attach meaning to printed words.

31. To recognize signs giving simple directions or information as: Boys, Girls. In, Out, Office, etc.

32. To begin to understand that writing conveys information.

33. To begin to see that words are made by combining letters.

34. To develop an awareness of letter formation and spacing of manuscript writing.

35. To attempt to copy words accurately.

36. To spell name and a few words correctly.

37. To know own name, teacher's name, school name, home address and phone number, date on calandar.

38. Deleted.

39. Deleted.

40. To begin to count, read, write and use numbers.

41. To develop concept of time in relation to clocks and activities.

42. To tell time by hour.

43. To identify the correct bus to take home.

44. To learn to give directions.

45. Deleted.

46. To recognize, understand, and respect authority -- police and bus driver.

47. To learn and practice good manners.

48. To begin to express his feelings in acceptable ways.

49. To avoid using physical force against others.

50. To begin to react appropriately to others.

51. To respond to peers and adults.

52. To attempt to be friendly.

53. To begin to observe weather.
54. To begin to understand how weather affects clothing.
55. To begin to have some understanding of time and use of clocks.
56. To identify weather as sunny, cloudy, rainy, hot, warm, or cool.
57. To begin to recognize seasonal changes.
58. To begin to develop concept of day and night.
59. To be aware that it takes time to get to school.
60. To begin to have understanding of space.
61. To listen to stories and poems.
62. To recite simple poems.
63. To begin to dramatize simple stories and experiences.
64. To begin to participate in simple drawings and craft activities.
65. To identify color.
66. To draw, paint and color simple direction.
67. To begin to use scissors.
68. To begin to enjoy nature.
69. To enjoy examining and collecting leaves.
70. To enjoy taking walk with adults to observe nature.
71. To come and go from school unattended.
72. To know what to do if lost.
73. To know why we have safety rules and laws.

909
~~009~~ SPEAKING AND LISTENING

A. Speaking

32. To identify common misuses of words in speech.

50. To evaluate one's own speech patterns.

54. To organize ideas in logical sequence.

56. To put only one complete thought in each spoken sentence.

64. To speak in complete sentences.

65. To answer a specific question in terms related to the subject, under consideration.

68. To participate effectively in group discussions.

70. To persist with the topic of discussion while giving evidence to support one's point of view.

73. To tell the plot of a short story.

78 To observe the contemporary social amenities, for example to say, "please", "thank you" and other social courtesies.

83. To criticize courteously and objectively.

90. To participate according to prearranged procedures, for example simplified parliamentry procedures.

91. To refrain from speaking when others are speaking.

102. To acknowledge a favor, show gratitude, or ask permission.

117. To dictate accounts or reports of one's own school experiences.

118. To use descriptive language to tell about an object, an action, or emotion, or sensory impressions of touch or sounds.

120. To criticize a book or poem for realism in details or satisfaction in the ending.

121. To express orally items of interest; to talk about real, imaginative, or funny experiences.

141. To clearly enunciate selected words.

149. To say nursery rhymes which give practice in various initial consonants, e.g., point of view.

163. To use pantomime as a means of expression.

24. To determine the meanings of new words which are heard by using context clues.

27. To identify the theme or major idea in an oral presentation.

29. To describe the mood of a story (poem). i.e., humorous, serious, informative.

33. To accurately outline in writing, a lengthy verbal communication.

37. To det ct misinformation and faulty concepts used in discussions.

38. To draw conclusions from what is heard.

40. To identify pertinent facts and information, in an oral presentation.

44. To identify the rhyme, rhythm and colorful combinations of selected words.

45. To distinguish fact from opinion in an oral presentation.

47. To summarize what has been heard.

48. To describe the emotion of the speaker as indicated by his pitch, stress, or mannerism of speech.

53. To supply missing words/expressions from familiar rhymes or stories told orally.

74. To retell in correct sequence a story that has been heard.

150. To distinguish between words that are similar such as do-too, fate-fade.

170. To follow spoken commands.

SPEAKING AND LISTENING Objectives

1. To listen with involvement in what is being taught or conveyed.
2. To listen to significant stimuli while eliminating distractions.
3. To improve attention to make the mind more receptive to ideas and unfamiliar material.
4. To identify sounds (other than words) that are within the range of their experience. i.e., a dog's bark, thunder, backgrounds sounds on film or record.
5. To appropriately react to "signal" sounds, i.e., fire bell, schedule bell, air raid, car horns.
6. To imitate sounds (other than words) that are within the range of experience. i.e., dog's bark, wind.
7. To determine the (compass) direction of a sound source. i.e., classmate's voice, bird's chirp.
8. To identify the familiar voice of a classmate without seeing him.
9. To determine the relative distance (nearness, farness) to a sound source. i.e., bird's chirp.
10. To identify the following characteristics of a sound: volume (intensity - loud or soft) pitch (high or low frequency).
11. To identify a particular consonant sound and consonant combinations at the beginning, middle or end of a word.
12. To identify particular vowels sound and diphthongs at the beginning, middle or end of a word.
13. To determine the number of syllables in a spoken word.
14. To determine the stressed syllable (primary accent) in a spoken word.
15. To identify similar roots within spoken words, i.e., transport, transportation, import and export.
16. To identify similar affixes (prefixes, suffixes) in spoken words. i.e., preview, prefix: beautiful, roundness.
17. To identify inflectional endings.
18. To determine the distinction between words very similar in sound. i.e., laboratory, lavatory.
19. To display the social amenities of listening by focusing their attention on the person or group speaking. i.e., not interrupting; not distracting.
20. To follow directions of procedure in the school situation. i.e., fire drills, organized games, work activities.
21. To listen for the names of teachers and children.
22. To listen as well as talk while participating in a conversation.
23. To appreciate that listening is a skill which can be improved by means of appropriate activities and practice.
24. By using the context clues, to dtermine the meanings of new words which are heard.
25. To listen in order to write a creative response to poetry, music or a story. i.e., art work, skit, dance, written.
26. To increase attention span through practice. i.e., teacher gradually increase length of stories told.
27. To listen for ideas, not just specific facts. i.e., major theme in a story - courage; main idea of a paragraph.

28. To listen for the purpose of retelling a story or event in sequence.
29. To recognize the mood of a story (poem). i.e., humorous, serious, informative.
30. To listen to literature, music and drama for appreciation.
31. To learn about other cultures and other peoples preferences through listening to different kinds of music, literature, expressions and dialects.
32. To listen for the correct use of words and recognize the misuse of words.
33. To listen for the purpose of note taking.
34. To recognize the limitations of the spoken word in order to ask clarifying question.
35. To listen as a panelist or debate participant in order to make a reply.
36. To listen for different viewpoints.
37. To detect mininformation and faulty concepts used in discussions. (critical thinking)
38. To sift, select and draw conclusions from what is heard. (critical thinking)
39. To recognize faulty sentence structure or errors in grammatical usage in speech.
40. To listen for pertinent facts and information.
41. To listen for accuracy in descriptions and definitions.
42. To listen in order to exchange ideas and experiences.
43. To listen to improve one's own fund of knowledge, both general and specific.
44. To listen for the rhyme, rhythm and colorful combinations of words.
45. To distinguish fact from opinion.
46. To identify the purpose of a spoken statement.
47. To summarize what has been heard.
48. To recognize the emotion of the speaker through his pitch, stress, or mannerism of speech.
49. To listen to teacher's answer to other pupils' questions as well as their own.
50. To listen to a tape recording of one's own voice in order to evaluate his speech.
51. To predict what will follow in a spoken statement.
52. To repeat information and directions heard in a spoken statement.
53. To supply missing words/expressions from familiar rhymes or stories told orally.
54. To organize ideas in logical sequence.
55. To express thoughts clearly.
56. To put only one complete thought in each spoken sentence.
57. To avoid unnecessary repitition in speaking.
58. To use expressions that are in good taste or appropriate for the situation.
59. To build a speaking vocabulary.
60. To use interesting, colorful and striking words.
61. To use new words.
62. To speak using standard grammar.
63. To show how the meanings of words can change.

64. To speak in complete sentences.

65. To answer a specific question in terms related to the subject.

66. To make clear explanations.

67. To define something, naming the class it belongs to, what it does, and how it is different from others.

68. To develop discussion skills according to the following levels:
    a) What happened, remembering, recounting, relating.
    b) How do you feel, deepening awareness of personal reaction.
    c) Could this really happen, reality testing, bringing incidents from real life to bear on story.
    d) What would you have done?
    e) What have we learned, conceptualizing, generalizing, finding the principle, reapplication.

69. To demonstrate a sense of logical continuity in a discussion.

70. To persist with the topic of discussion while giving evidence to support one's point of view.

71. To tell one thing about a story read.

72. To tell more than one thing about a story read.

73. To tell the plot of a short story briefly.

74. To retell in correct sequence a story that has been heard.

75. To tell a story that has already been written.

76. To tell an original story.

77. To talk about experiences at home, at school, in the neighborhood.

78. To observe the contemporary social amenities, for example to say, "please", "thank you" and other social courtesies.

79. To make introductions.

80. To introduce one's self.

81. To acknowledge introductions.

82. To praise sincerely.

83. To criticize courteously and objectively.

84. To look at person to whom one is talking.

85. To include everyone in the group.

86. To speak with others' interest in mind in class or conversation.

87. To take one's share of the time when speaking in a group situation.

88. To accept that in group action everyone has the right of expression.

89. To accept a query with a courteous response.

90. To participate according to prearranged procedures, for example simplified parliamentry procedures.

91. To refrain from speaking when others are speaking.

92. To convey a message to parents or other family members.

93. To talk as a part of peer groups or family circle.

94. To take part in "small talk" effectively.

95. To converse with new acquaintances.
96. To give directions to specific places in the building or in the neighborhood.
97. To complete a telephone conversation.
98. To act as guides for visitors.
99. To conduct an interview asking questions.
100. To ask appropriate questions.
101. To answer at the time appropriate for response.
102. To acknowledge a favor, show gratitude, or ask permission.
103. To contribute a suggestion, an idea or an experience related to what is being discussed.
104. To express personal opinions about current issues and ideas.
105. To speak at a rate that permits easy comprehension.
106. To pace speech in order to maintain sustained listening.
107. To adapt one's voice to the size of the room and distance from listener.
108. To use an appropriate stress and intonation, to reflect feeling, mood and meaning.
109. To speak in pleasant tones.
110. To vary the voice while reading.
111. To speak distinctly.
112. To relate incidents and experiences objectively.
113. To demonstrate poise before a group.
114. To say poems in simple unison.
115. To participate in choral speaking.
116. To speak through puppets.
117. To dictate accounts or reports of their school experiences.
118. To use descriptive language to tell about an object, an action, or emotion, sensory impressions of touch or sounds.
119. To express one's meaning for what is read or spoken.
120. To criticize a book or poem for realism in details or satisfaction in the ending.
121. To express orally items of interest; to talk about real, imaginative, or funny experiences.
122. To dramatize stories and poems.
123. To create character and incident from the imaginary world through dramatic play.
124. To role play.
125. To portray a character from a book or give an imitation of a well-known individual
126. To tell a story imitating sounds such as animals, or nature sounds, etc.
127. To play a role in a play or skit.
128. To present a book review or project to the group.
129. To address a larger group than the average class.
130. To read an original composition to the class.

131. To appeal to the class for support of a cause.
132. To participate in debates, panel discussions, or programs.
133. To recite a well-known selection from memory.
134. To make an informal talk before class about hobby, trip or interest.
135. To address committee members or give a brief report.
136. To report on trips or events.
137. To speak into a microphone.
138. To express appreciation for assistance given by others.
139. To invite another group or class to share an activity.
140. To speak extemporaneously on a topic for a specified brief period.
141. To clearly enunciate.
142. To say sentences that contain tongue twisters - ex., peter piper picked a peck of pickled peppers.
143. To speak with a natural tone.
144. To use proper stress to insure correct interpretation, i.e., present and present.
145. To overcome speech immaturities.
146. To correct common speech problems.
147. To use tape recorder or other audio aids for practice improvement.
148. To practice vowel and consonant sounds in sample words to improve speech.
149. To say nursery rhymes which give practice in various initial consonants. ex., simple simon.
150. To distinguish between sounds that are similar such as do-too, fate-fade.
151. To practice word beginnings and endings.
152. To ask questions for assistance and clarification.
153. To develop self-concept.
154. To develop self-esteem.
155. To develop individual limitations.
156. To develop external controls.
157. To develop internal controls.
158. To develop awareness to surroundings.
159. To develop appropriate reactions.
160. To supply personal information.
161. To make decisions based on reasoning.
162. To identify meaning of basic word concepts. i.e., in and out.
163. To use pantomime as a means of expression.
164. To use words and pantomime as a means of expression.
165. To construct in correct sequence, a story through pictures.
166. To express moods by facial expression.

167. To decode a visual communication.

168. To effect a communication through hand signals.

169. To give verbal commands.

170. To follow spoken commands.

171. To follow visual commands.

172. To follow signal commands.

173. To construct acceptable attention getting methods, such as a tug, tough, etc.

174. To identify bodily needs, i.e., thirst, hunger, etc.

175. To identify labels for people, places and things.

176. To develop the speech mechanism.

177. To motivate the desire to verbalize.

178. To identify the need to verbalize.

APPENDIX C

REVISED AND UNREVISED INTEREST VARIABLES

STATE UNIVERSITY COLLEGE AT BUFFALO 1300 Elmwood Avenue • Buffalo, New York 14222

FACULTY OF PROFESSIONAL STUDIES • DEAN ROBERT B. SIMPSON
research and development complex *Phone* • 716-862-8506

ELIZABETH L. AYRE • Director
KENNETH CROSS • Research Coordinator

To: R & D Professional Staff

From: Tom C.

Re: Revision of student variables for CBRU's

STUDENT INTERESTS

1. Agriculture
2. Anthropology
3. Astronomy
4. Biography/Autobiography
5. Biology
6. Botany/Zoology
7. Business
8. Chemistry
9. Communication
10. EarthScience/ Geography
11. Fine Arts/Crafts
12. Foreign Cultures/Languages
13. Folklore/Customs
14. History
15. Home Economics
16. Mathematics
17. Philosophy/Ethics
18. Physics
19. Political Science/Law
20. Psychology
21. Religion
22. Economics
23. Education
24. Engineering/Technology
25. Fiction/Mythology
26. Sociology/Family Living
27. Sports/Recreation
28. Transportation
29. Performing Arts
30. Medicine/Health
31. Adventure
32. Poetry
33. Creative Writing

Your reactions please. tjc

INSTRUCTIONAL VARIABLES

GENERAL INTEREST

1. Philosophy
2. Psychology
3. Logic
4. Morals
5. Religion
6. Political Science
7. Economics
8. Law
9. Education
10. Commerce
11. Everyday Experiences
12. Folklore
13. Language
14. Astronomy
15. Chemistry
16. Earth Science
17. Mathematics
18. Physics
19. Anthropology
20. Biological Science
21. Engineering
22. Agriculture
23. Domestic Science
24. Other Places
25. Animals
26. Famous People
27. Natural Phenomenon
28. Creating and Construction
29. Fine Arts
30. Photography
31. Biography or Autobiography
32. Drama
33. Fiction
34. Poetry
35. Geography
36. History
37. Sports/Leisure
38. Social Science
39. Physical Science
40. Natural Science
41. Humanities
42. Music
43. Art
44. Creative Writing
45. Adventure
46. Non-Fiction
47. Early Days
48. Modern Wonders
49. Old Tales
50. Fun
51. Automobiles
52. Transportation

OCCUPATIONAL INTERESTS

53. Industry
54. Communication
55. Transportation
56. Homemaking/Home Nursing/Child Care
57. Food/Agriculture
58. Finance
59. Business/Office
60. Sales/Marketing
61. Recreating/Travel
62. Service
63. Conservation
64. Arts & Entertainment
65. Science/Research

APPENDIX D

VARIABLE PROFILE MATRIX

VARIABLE PROFILE MATRIX 0909 SPEAKING AND LISTENING

VARIABLE NUMBER	NUMBER CONTENT	NUMBER ACTIVITIES	NUMBER MATERIALS	NUMBER MEA DEV
1	12	62	50	
2				
3				
4				
5				
6				
7				
8				
9	1		1	
10				
11	51	139	104	
12		3	3	
13	61	343	156	
14				
15		1		
16		2		
17		1		
18		1	1	
19				
20	1	1		
21				
22				
23	1	1	1	
24		1	2	
25		1	2	
26		1		
27				
28		1		
29	5	9	6	
30				
31				
32	12	50	18	
33	1	31	26	
34	7	25	21	
35		2	1	
36				
37		2	3	
38		8		
39				
40				
41				
42	3	15	12	
43		12	4	
44		2	2	

VARIABLE PROFILE MATRIX 0909 SPEAKING AND LISTENING

VARIABLE NUMBER	NUMBER CONTENT	NUMBER ACTIVITIES	NUMBER MATERIALS	NUMBER MEA DEV
45		2	3	
46	1	11	31	
47				
48				
49		2	6	
50				
51				
52			1	
53				
54	63	341	152	
55				
56				
57				
58		1		
59				
60				
61				
62				
63				
64	5	5	10	
65				
66				
67				
68				
69				
70				
71				
72	59	17	1	
73	59	17	1	
74		1		
75	9	33	32	
76	12	52	13	
77	1	7	2	
78	41	309	139	
79	45	158	78	
80	9	4		
81	15	58	22	
82	10	7	2	
83	15	3	2	
84				
85	7	1		
86	2			
87	2			
88	23	3		

VARIABLE PROFILE MATRIX 0909 SPEAKING AND LISTENING

VARIABLE NUMBER	NUMBER CONTENT	NUMBER ACTIVITIES	NUMBER MATERIALS	NUMBER MEA DEV
89	23		1	
90				
91	13	2	3	
92	1			
93	54	334	157	
94				
95				
96				
97				
98	9	21	24	
99	4	12	18	
100				
101				
102				
103			62	
104			71	
105			94	
106			117	
107			119	
108			115	
109			106	
110			102	
111			56	
112			51	
113			51	
114			2	
115			2	
116			2	
117				
118				
119				
120				
121				
122		18		
123		177		
124		22		
125		11		
126		62		
127		4		
128		36		
129		255		
130		188		
131		2		
132				

VARIABLE PROFILE MATRIX 0909 SPEAKING AND LISTENING

VARIABLE NUMBER	NUMBER CONTENT	NUMBER ACTIVITIES	NUMBER MATERIALS	NUMBER MEA DEV
133		13		
134		19		
135				
136		17		
137		31		
138		1		
139		1		
140		320		
141				
142				
143				
144				
145				
146				
147				
148				
149				
150				
151				
152				
153				
154				
155			27	
156			95	
157			38	
158			116	
159			5	
160			75	
161			2	
162			8	
163				
164				
165				
166				
167				
168				
169				
170				
171				
172				
173				
174				
175				
176				

VARIABLE PROFILE MATRIX 0909 SPEAKING AND LISTENING

VARIABLE NUMBER	NUMBER CONTENT	NUMBER ACTIVITIES	NUMBER MATERIALS	NUMBER MEA DEV
177				
178				
179				
180				
181		1		
182		18		
183		241		
184		74		
185				
186				
187				
188				
189				
190				
191				
192				
193				
194				
195				
196				
197				
198				
199				
200			1	
201	33	153	87	
202	46	241	130	
203	55	293	127	
204	61	318	115	
205	54	286	64	
206	50	146	56	
207	50	141	54	
208	43	69	5	
209	43	66	5	
210	43	61	5	
211	43	61		
212	43	61		
213	43	61		
214	6			
215	6			
216	6			
217				
218				
219				
220				

VARIABLE PROFILE MATRIX 0909 SPEAKING AND LISTENING

VARIABLE NUMBER	NUMBER CONTENT	NUMBER ACTIVITIES	NUMBER MATERIALS	NUMBER MEA DEV
221				
222				
223				
224				
225			1	
226	29	174	89	
227	44	258	128	
228	53	323	125	
229	60	319	110	
230	53	185	63	
231	49	133	55	
232	48	128	54	
233	43	61	2	
234	43	60	2	
235	43	60	2	
236				
237				
238				
239				
240				
241				
242				
243		204	42	
244		308	149	
245		6	24	
246		319	150	
247		254	151	
248		306	143	
249				
250				
251				
252				
253				
254				
255				
256				
257				
258		307	1	
259		62		
260		49		
261				
262				
263				
264				

VARIABLE PROFILE MATRIX 0909 SPEAKING AND LISTENING

VARIABLE NUMBER	NUMBER CONTENT	NUMBER ACTIVITIES	NUMBER MATERIALS	NUMBER MEA DEV
265				
266		1		
267				
268				
269				
270				
271				
272				
273				
274				
275				
276				
277				
278				
279				
280				
281				
282				
283				
284				
285				
286				
287				
288				
289				
290				
291				
292				
293				
294				
295				
296				
297				
298				
299				
300				
301				
302				
303				
304	5	322	148	
305				
306				
307				
308				

VARIABLE PROFILE MATRIX 0909 SPEAKING AND LISTENING

VARIABLE NUMBER	NUMBER CONTENT	NUMBER ACTIVITIES	NUMBER MATERIALS	NUMBER MEA DEV
309				
310				
311				
312				
313				
314				
315				
316				
317			1	
318				
319				
320		5		

APPENDIX E

TAILORED REQUEST FORMS

INSTRUCTIONAL VARIABLES LIST

FOR UNIT ON MEASUREMENT

1. General Interest

11. Everyday Experiences	18. Physics
12. Folklore	21. Engineering
14. Astronomy	28. Creating and Construction
15. Chemistry	35. Geography
16. Earth Science	36. History
17. Mathematics	

2. Sex

72. Male	73. Female

3. Developmental Tasks

76. Learning to Get Along with Age-mates
77. Learning An Appropriate Masculine or Feminine Soc al Role
78. Developing Fundamental Skills in Reading, Writing and Calculating
79. Developing Concepts Necessary for Everyday Living
81. Achieving Personal Independence
86. Achieving Assurances of Economic Independence
87. Selecting and Preparing for an Occupation

4. Reading Level (Relative to Grade Level)

109. 2.5	115. 8
110. 3	116. 9
111. 4	117. 10
112. 5	118. 11
113. 6	119. 12
114. 7	120. above 12

5. Mental Age

205. 8.0	209. 12.0
206. 9.0	210. 13.0
207. 10.0	211. 14.0
208. 11.0	

6. Chronological Age

229. 8.0	233. 12.0
230. 9.0	234. 13.0
231. 10.0	235. 14.0
232. 11.0	

7. Physical Handicaps

243. Blind	256. Hard of Hearing
244. Partially Sighted	247. Gross Motor Disability
245. Deaf	248. Fine Motor Disability

INSTRUCTIONAL VARIABLES FOR UNIT

ON GOING TO AND FROM SCHOOL

1. General Interests (select 3-5)

8.	Law	23.	Home Economics
9.	Education	24.	Other Places
11.	Everyday Experiences	28.	Creating and Construction
13.	Language	32.	Drama
17.	Mathematics	42.	Music
20.	Biological Science	43.	Art
23.	Home Economics	45.	Adventure
		52.	Transportation

2. Sex

72. Male 73. Female

3. Developmental Tasks for Middle Childhood

74. Learning physical skills.
75. Building wholesome attitudes toward oneself as a growing organism.
76. Learning to get along with age-mates.
77. Learning an appropriate masculine or feminine social role.
78. Developing fundamental skills in reading, writing, and calculating.
79. Developing concepts necessary for everyday living.
80. Developing conscience, morality, and a system of values.
81. Achieving personal independence.
82. Developing attitudes toward social groups and institutions.

4. Reading Level (Relative to grade level not age level)

103.	Non-reader	107.	1.5	110.	3
104.	Pre-primer	108.	2	111.	4
105.	Primer	109.	2.5	112.	5
106.	1				

5. Mental Age

199.	3.0	202.	5.0	205.	8.0
200.	3.5	203.	6.0	206.	9.0
201.	4.0	204.	7.0		

6. Chronological Age

225.	4.0	228.	7.0
226.	5.0	229.	8.0
227.	6.0	230.	9.0

7. Physical Handicaps

243.	Blind	246.	Hard of Hearing
244.	Partially Sighted	247.	Gross Motor Disability
245.	Deaf	248.	Fine Motor Disability

8. Learning Environment

258.	Classroom	259.	Outdoors	260.	Gymnasium

INSTRUCTIONAL VARIABLES FOR

UNIT ON SPEAKING AND LISTENING

1. General Interests (select 3-5)

11. Everyday experiences
12. Folklore
13. Language
15. Chemistry
28. Creating and Construction
29. Fine Arts
32. Drama
33. Fiction
34. Poetry
42. Music
43. Art
46. Non-Fiction

2. Sex

72. Male
73. Female

3. Developmental Tasks (Items 74-85 relate more specifically to elementary students while 86-91 are related to junior and senior high school)

74. Learning Physical Skills Necessary for Ordinary Games
Building Wholesome Attitudes Toward Oneself as a Growing Organism
Learning to Get Along With Age-Mates
Learning An Appropriate Masculine or Feminine Social Role
78. Developing Fundamental Skills in Reading, Writing, and Calculating
79. Developing Concepts Necessary for Everyday Living
80. Developing Conscience, Morality, and A System of Values
81. Achieving Personal Independence
82. Developing Attitudes Toward Social Groups and Institutions
83. Accepting New and More Mature Relations With Age-Mates of Both Sexes
84. Accepting One's Physique (Male and Female Role)
85. Achieving Emotional Independence from Parents and Other Adults
86. Achieving Assurances of Economic Independence
87. Selecting and Preparing for an Occupation
88. Developing Intellectual Skills and Concepts Necessary for Civic Competence
89. Desiring and Achieving Socially Responsible Behavior
90. Preparing for Marriage and Family Life
91. Acquiring a Set of Values and Ethical System as a Guide to Behavior

4. Reading Level (Relative to Grade Level not Age Level)

103. Non-Reader
104. Pre-Primer
105. Primer
106. 1
107. 1.5
108. 2
109. 2.5
110. 3
111. 4
112. 5
113. 6
114. 7
115. 8
116. 9
117. 10
118. 11
119. 12
120. above 12

5. Mental Age

202. 5.0
203. 6.0
204. 7.0
205. 8.0
206. 9.0
207. 10.0
208. 11.0
209. 12.0

6. Chronological Age

226. 5.0
227. 6.0
228. 7.0
229. 8.0
230. 9.0
231. 10.0
232. 11.0
233. 12.0
234. 13.0
235. 14.0

7. Physical Handicaps

243. Blind
244. Partially Sighted
245. Deaf
246. Hard of Hearing
247. Gross Motor Disability
248. Fine Motor Disability

8. Learning Environment

258. Classroom
259. Outdoors
260. Gymnasium

APPENDIX F

OBJECTIVE PROFILE MATRIX

1			1
2	6	19	13
3			
4	3	21	16
5	2	12	12
6			
7	1	4	3
8			
9	1	4	1
10	9	17	22
11	10	18	63
12	13	13	57
13	11	14	22
14	12	9	19
15	9	11	20
16	8	14	33
17	7	4	6
18	6	8	13
19			
20	9	28	10
21			1
22			
23			
24	7	14	16
25			
26			
27	7	15	5
28	5	20	11
29	5	14	10
30			
31	5	4	7
32	7	14	11
33	4	16	2
34			
35			
36			
37	14	12	3
38	9	10	6
39	3	5	7
40	12	25	5
41	15	20	9
42			
43			
44	4	24	29

45	13	13	4		
46					
47	7	15	4		
48	6	12	4		
49					
50		4	1		
51			3		
52					
53	1	13	10		
54	9	21	14		
55					
56	5	3	3		
57					
58					
59					
60					
61					
62					
63	8	1	10		
64	8	18	8		
65	5	15	3		
66	14	17	8		
67	11	23	5		
68	15	35	6		
69					
70					
71					
72					
73	2	1	2		
74	2	9	6		
75					
76					
77		1			
78	3	14	6		
79					
80					
81					
82					
83	9	9	1		
84					
85					
86					
87					
88					

APPENDIX G

COMPUTER BASED RESOURCE UNIT

MATERIALS DATA FORM

CESE MATERIALS FORM* Unit #_____

Material#_____ TYPE OF MATERIAL_____

MEDIAGRAPHIC DATA

Chapter or Article Title:_____

Title:_____

Author:_____

Publisher/Source/Address/Vol./Month/Year:_____

_____

_____

DESCRIPTION (Circle appropriate descriptors and/or indicate other information which would be useful to the user.)

Sound Silent Color b/w 8 mm 16 mm Super 8

_____

_____

COST (Circle appropriate descriptors and/or indicate other cost information which would be useful to the user.)

Free On Loan Purchase Rental

_____

_____

ADDITIONAL INFORMATION_____

_____

SPECIAL APPLICATION FOR THE HANDICAPPED_____

_____

CODING INFORMATION

C.A. Range_____M.A. Range_____

Reading Grade Level Range_____

USE BACK OF THIS FORM FOR ANNOTATION (Approx. 50 words maximum; be clear, concise and informative.

*Depending upon type of material, only certain segments of this form should be utilized. Please write legibly!

Material report submitted by_____

MATERIAL TYPES

Art Print
Article
Book
Chart
Film Loop
Film
Filmstrip
Flashcard
Globe
Kit
Map
Microfiche
Microfilm
Model
Pamphlet
Periodical
Picture
Poster
Realia
Reprint
Resource Person
Record
Slide
Study Print
Tape
Transparency
Video Tape
etc.

APPENDIX H

COMPUTER BASED RESOURCE UNIT ABSTRACTS

COMPUTER ASSISTED PLANNING

. . . for individualizing instruction

C. A. P. Abstracts

Faculty of Professional Studies

Research and Development Complex

State University College at Buffalo, New York

Under grants from

United States Office of Education
and
New York State Education Department

Computer Based Resource Units

Alcohol (062) examines the effects of methyl and ethyl alcohol on the body and on behavior, and the correlation between alcohol and disease. The unit explores the relationship between the alcohol user, his family and the community as well as the effect of alcohol use on the economy. (G.L. K–12).

American Civilization in Historical Perspective (024) explores the social, political and educational forces which have molded American society in the last century. The evolutionary role of the educational system, social control, science, technology, mass communication and the plight of minority groups are investigated. (M.A. 14–18).

American People (026) examines the people comprising American society. The history of immigration from the pre-Columbian period is explored along with its associated problems of alienation, acculturation and assimilation. Family units and the roles of individuals are viewed, and there is also information about civil and women's rights and population trends. (M.A. 15–18).

American Cultural Revolution (005) is a study of forces which have contributed to contemporary culture and includes such topics as: the impact of youth, automation, alienation, social reform, censorship and religion. Activities stress pupil investigation of contemporary problems. Many of the materials are avant garde publications. (M.A. 15–18).

Career Education (003) provides the understanding and techniques necessary to gain employment. Various types of jobs and expectations related to them are studied as well as the process of seeking a job – application and interview; evaluation of one's own qualifications. The unit also discusses relationships between employees and employers and the meaning of money and financial benefits. (M.A. 4–14).

Communication (017) is concerned with techniques essential for making oneself understood and for understanding others. The unit traces the history and development of communication from pre-historic times, defines the nature and characteristics of communication and deals with specific means of communication by defining ways by which we exchange thoughts and ideas. Communication in contemporary society is explored by analyzing the effect of technological advances on our everyday lives. (M.A. 5–12).

Note: The abbreviation G.L. stands for Grade Level, and the abbreviation M.A. stands for Mental Age Range.

Dental Health: Health Status (058) deals with the development of positive attitudes and practices of dental and personal health. Activities help identify and analyze basic concepts related to health. Students are encouraged to demonstrate attitudes and performances which will lead to a systematic, daily regimen for achieving and maintaining optimum individual growth and development. The K–6 segment emphasized personal systematic health practices; the 7–12 segment deals with community and group health concerns. (G.L. K–12).

Disease Prevention and Control (060) is concerned with description, identification and prevention of communicable diseases. The role of the individual, family, community and government agencies in prevention and control is analyzed. Historical developments are traced and opportunities for analysis and evaluation of current scientific research are provided. Development of good personal health habits is emphasized. (G.L. K–12).

Drugs: Mood Modification (063) explores physiological, psychological and sociological forces which lead to drug abuse and to the results of such abuse. The nature and properties of drugs and narcotics, specific effects on the body and treatment for habituation and addiction are studied as well as government controls and possible solutions to this critical problem. (G.L. K–12).

Ecology and Epidemiology (066) deals with the relationship of man and his environment and the interaction of factors in his physical, social and biological environments. Preventive medicine, research and current public health issues and their relationship to ecology and modern concepts of health, disease and longevity are analyzed. (G.L. 7–12).

Environmental and Public Health (065) asserts that man has the ability to destroy or preserve the earth's beauty and benefits through thoughtless exploitation or effective planning and constructive action. Potentially hazardous elements in our environment are identified, and ways in which the individual, family community, and private and public agencies can work to preserve our environment are analyzed. The work of public health agenices is particualrly stressed. (G.L. K–12).

First Aid and Survival (068) stresses development of "universal" first aid techniques in event of emergency. For younger students emphasis is placed on the identification of emergency situations and the development of attitudes related to accident prevention. For older students the practice of basic first aid techniques is stressed. (G.L. K–12).

Market Place (022) helps children understand the basic principles of modern economics. The concept of unlimited wants and limited resources is the basis of this study which stresses scarcity, work, money, production and marketing, and the effect of their interrelationships. Work is examined with emphasis on relating daily chores to the pupil's eventual role in a working society. Efforts are made to develop wise and practical consumers. (M.A. 7–12).

My Home and Family (110) is designed to improve the self-concept of the migrant child. Attention is focused on interrelationships and interdependencies among family members. The unit explores the characteristics of families from cultural background and helps children value the uniqueness of their own particular heritage. It stresses both the child's sense of belonging to a group and his identification as an individual. Exercises are provided so that the child can evaluate his feelings and offers suggestions for emphasizing positive concepts and changing negative attitudes. (M.A. 4–9).

News Media in American Society (015) examines the history, development and techniques of news dissemination: newspapers, television and radio. Particular attention is paid to major contributors to the media, the role of free and diversified sources of opinion to an open society, the nature and impact of advertising, and the nature and recognition of propaganda techniques. (M.A. 7–20).

Nutrition (057) identifies varieties, forms and sources of food and develops criteria for its selection. Comparisons are made between foods eaten and health, growth and development. Relationships between social, emotional, psychological and chronological factors and food selection are delineated. In upper grades, current societal trends and nutritional status such as fashions, styles, advertising and technology are analyzed. (G.L. K–12).

Safety Education (067) develops proper safety attitudes and procedures in daily life, sports, leisure, natural and nuclear disasters. Activities for younger students help identify unsafe situations and hazards in home and community. Stress is placed on attitudes and courtesy as a means of preventing accidents. Activities for older students demonstrate comparisons concerning attitudes, age, sex, numbers of accidents. Emergency procedures are emphasized. (G.L. K–12).

Sensory Perception (059) identifies the function and importance of the sense organs. Periodic assessment, constant care and protection is stressed in the lower grades, while analysis of functions and characteristics of video and audio senses is considered in upper grades. Proper utilization of sensory aids and services to assist those with perceptual problems are studied. (G.L. K–12).

Solar System and Beyond (020) explores similarities and differences between solar bodies, their compositions and habits. Instruments that use the solar system to give information about Earth or help to discover the nature of the solar system are explained as is measurement, direction and position in the solar system and the influence it has upon the earth. Astrology, myths, theories and the use of astronomy in literature are also investigated. (M.A. 6–13).

Tobacco (061) discusses the physical effects of smoking – correlations between smoking and disease, research development and tobacco habituation – and explores social and psychological values and attitudes associated with smoking and the effects of government and advertising on tobacco consumption. (G.L. K–12).

Transportation (023) focuses on three major areas: historical development including inventions, motivating factors and consequences; the relationship between transportation and natural environment including present day problems; and finally, the relationship between man and transportation including psychological implications for interpersonal relationships and the changing community. (M.A. 5–13).

Trees to Toads – A Child's World (111) uses living things common to the rural or migrant environment to develop skills in oral and written communication. Activities provide insight into the child's immediate world thereby expanding his experimental background. The unit is particularly valuable to the Spanish-speaking. (M.A. 4–9).

World Health (070) identifies the scope of world health problems and demonstrates the relationship between geography, technology, education, culture, economics, political standards and these problems. The work of world health agencies is analyzed including their degree of success or failure. The unit stresses the need to recognize the relationship between local and world health problems and the need for international cooperation in raising the level of health. (G.L. 4–12).

Skill Development Programs

Going To and From School (808) helps children learn basic concepts needed to make responsible decisions. The daily trip to school on the bus or walking and the importance of indoor and outdoor safety is stressed. Acceptable ways of relating to one another, the importance and "how to" of being healthy, and the ability to share experiences and feelings are also provided. (M.A. 4–9).

I.T.P.A. (043) provides developmental learning strategies to be used with children identified as perceptually handicapped by the Illinois Test of Psycholinguistic Abilities. It focuses on perceptual skill development in areas of auditory or visual reception, auditory or visual memory, auditory or visual association, auditory or visual closure, verbal or manual expression, gramatic closure and sound blending. The instructor can integrate the objectives and activities as part of a long-range program. (G.L. K–6).

Management of Social Behavior (102) is designed for the child who demonstrates undesirable social behavior. Activities are directed toward the development of responsibility, realistic decision-making, increased self-concept and social conscience. Some activities are designed to eliminate behavior harmful to the individual or those around him. (M.A. 5–12).

Measurement (002) explores standard and metric units and their relationship to volume, area and circumference. The measurement of speed and distance, forms of measurement (nautical and land miles, light years) and the relation of earth measurements to time are studied. Concepts such as money, scale drawing and heat are also covered. There are opportunities for students to practice all these forms of measurement. (M.A. 8–14).

Movigenics (006), a theory of movement as it relates to learning, studies the origin and development of patterns of movement in man and the relationship of those movements to his learning efficiency. Attention is given to social, psychological and cognitive senses of movement as well as to physical movement. Suggestions are made to help children achieve a space perspective and move with greatest possible efficiency. (All Ages).

Speaking and Listening (009) asserts that speaking and listening skills develop in conjunction. The unit spans the remedial and developmental phases of speaking and listening and covers group and individual situations. Exercises such as sound placement, sound-symbol identification, sound discrimination are used as well as exercises in storytelling, role playing, chanting and discussion. (M.A. 5–12).

FOR FURTHER INFORMATION ON:

Cost, Request Procedures, or Unit Abstracts related to Computer Assisted Planning, direct your inquiries to:

Computer Assisted Planning
Communications Center
Professional Studies Research & Development Complex
State University College at Buffalo
1300 Elmwood Avenue
Buffalo, New York 14222

(716) 862-5433

FOR FURTHER INFORMATION ON:

Theoretical rationale, unit development, and research related to Computer Assisted Planning, direct your inquiries to:

Computer Assisted Planning
Professional Studies Research & Development Complex
State University College at Buffalo
1300 Elmwood Avenue
Buffalo, New York 14222

(716) 862-5433

APPENDIX I

PRIOR
COMPUTER BASED RESOURCE UNIT
EVALUATION FORM

STATE UNIVERSITY COLLEGE AT BUFFALO
NEW YORK STATE REGIONAL SPECIAL EDUCATION INSTRUCTIONAL MATERIALS CENTER
1300 ELMWOOD AVENUE
BUFFALO, NEW YORK 14222

Dear Teacher,

.....So YOU used a Computer Based Resource Unit! Now, could you please just take a few minutes to check your reactions? It is very important for us to evaluate this project in terms of further development and growth. YOUR response will determine our future direction.

Thank you.

M. Brown
Project Associate

QUESTIONNAIRE:

TITLE OF UNIT USED_____

TYPE OF CLASSROOM: (Check one of below)

Educable MR____ Trainable MR____ Learning Disability____ Phys. Handicap____
Other____

1. The CBRU aided me in planning instruction for the students I teach:

   Extensively___ Moderately___ Very little___ Not at all___

2. The objectives stated in the unit, in relation to the students I teach were:

   Mostly appropriate___ Moderately appropriate___ Mostly inappropriate___

3. The activities described in the unit, in relation to the objectives were:

   Mostly appropriate___ Moderately appropriate___ Mostly inappropriate___

4. The activities described in the unit, in relation to the students I teach were:

   Mostly appropriate___ Moderately appropriate___ Mostly inappropriate___

5. The CBRU contained:

   Many ideas that were new to me___ Some ideas that were new to me___
   Very few ideas that were new to me___ No ideas that were new to me___

6. The use of the CBRU in my instruction planning stimulated my thinking toward new ideas:

   Greatly___ Moderately___ Very little___ Not at all___

7. The resource materials listed in the unit were:

   Very appropriate to the objectives and activities___
   Moderately appropriate to the objectives and activities___
   Had little relationship to the objectives and activities___

8. The resource materials listed in the unit were:

   Easily obtained___ Mostly unavailable to me___

9. The section of the CBRU that was most useful to me was:

   Content___ Listing of objectives___ Listing of activities___
   Listing of materials___ Measuring devices___

10. If I could modify the CBRU's, I would change the section dealing with:

    Content___ Objectives___ Activities___ Materials___ Measuring devices___
    Would not change at all___

11. As a result of using CBRU, it was possible to provide more individual objectives, activities and materials:

    Yes___ No___

12. I would use the CBRU again:

    Yes___ No___

COMMENTS:

If you wish, you may sign your name.

NAME _____

ADDRESS _____

_____

DATE _____

APPENDIX J

CURRENT
COMPUTER BASED RESOURCE UNIT
EVALUATION FORM

EVALUATION OF A COMPUTER BASED RESOURCE GUIDE

THE DISTINCT POSSIBILITY OF COMPUTER BASED RESOURCE UNITS DEMANDS TO A GREAT EXTENT OUR ASSESSMENT OF THE PRINT-OUT YOU HAVE RECEIVED. YOUR RESPONSES TO THE FOLLOWING STATEMENTS SHOULD TAKE ONLY A FEW MINUTES TO COMPLETE. OF PARTICULAR CONCERN ARE YOUR WRITTEN RESPONSES WHICH ARE SOLICITED IN SEVERAL OF THE ITEMS.

TITLE OF UNIT USED_____

AVERAGE AGE OF CHILDREN IN CLASS_____

HAVE YOU PREVIOUSLY USED A COMPUTER BASED RESOURCE GUIDE YES____ NO____

THE CLASS CONSISTED OF PREDOMINATELY TYPICAL CHILDREN___ ATYPICAL CHILDREN____
IF ATYPICAL, PLEASE SPECIFY (E.G. TRAINABLE M.R., PHYSICALLY HANDICAPPED).
_____

PLEASE CIRCLE THE APPROPRIATE NUMBER.

	GREATLY	MODERATELY	VERY LITTLE	NOT AT ALL
1. THE COMPUTER BASED RESOURCE GUIDE AIDED ME IN PLANNING INSTRUCTIONS FOR THE STUDENTS I TEACH	4	3	2	1
2. THE USE OF THIS COMPUTER BASED RESOURCE GUIDE STIMULATED MY THINKING REGARDING NEW TECHNIQUES AND MATERIALS	4	3	2	1
3. TO WHAT EXTENT DID THE USE OF THE COMPUTER BASED RESOURCE GUIDE FACILITATE THE INDIVIDUALIZATION OF INSTRUCTION IN YOUR CLASSROOM	4	3	2	1
4. TO WHAT EXTENT DID YOUR STUDENTS REACT FAVORABLY TO THE USE OF THIS COMPUTER BASED RESOURCE GUIDE	4	3	2	1
5. 10. INDICATE FOR EACH OF THE COMPONENTS LISTED BELOW ITS USEFULNESS IN PLANNING AND IMPLEMENTING INSTRUCTIONAL STRATEGIES FOR YOUR STUDENTS .				
A. OBJECTIVES	4	3	2	1
B. CONTENT	4	3	2	1

6. [illegible] 3 2 1

7. [illegible] 3 2 1

8. [illegible] 3 2 1

9. [illegible] 3 2 1

11. DO YOU PLAN TO USE COMPUTER BASED RESOURCE GUIDES IN THE FUTURE
YES---- NO----

12. THE SECTION OF THE GUIDE MOST VALUABLE WAS TOTAL GROUP SUGGESTIONS----
INDIVIDUAL SUGGESTIONS---- NEITHER---- BOTH OF EQUAL VALUE----.

13. INDICATE THE NUMBER(S) OF ANY STATEMENTS YOU FOUND EXCEPTIONALLY HELPFUL
(E.G. MATERIAL =13, ACTIVITY =17).

14. INDICATE THE NUMBER(S) OF ANY STATEMENTS YOU FOUND TO BE TOTALLY
INAPPROPRIATE OR ERRONEOUS. (PLEASE CLARIFY.)

15. WHAT OTHER TOPICS WOULD YOU LIKE TO SEE IN THE FORM OF A COMPUTER BASED
RESOURCE UNIT

10. INDICATE ANY ADDITIONAL INFORMATION WHICH WE MIGHT FIND USEFUL IN IMPROVING COMPUTER BASED RESOURCE UNITS AND/OR ELABORATE ON ANY OF YOUR PREVIOUS ANSWERS. ALSO INDICATE ANY VALUABLE MATERIALS, ACTIVITIES, OR MEASURING DEVICES WHICH YOU UTILIZED WHICH WERE NOT IN THE GUIDE. (PLEASE USE THE BACK OF THIS PAPER.)

IF YOU WISH YOU MAY SIGN YOUR NAME

NAME ----------

ADDRESS ----------

DATE ----------

RETURN TO
STATE UNIVERSITY COLLEGE AT BUFFALO
RESEARCH AND DEVELOPMENT COMPLEX
1300 ELMWOOD AVENUE
BUFFALO, NEW YORK 14222
ATTENTION G. BIANCHI

APPENDIX K
COMPUTER BASED RESOURCE UNITS CURRENTLY AVAILABLE

COMPUTER ASSISTED PLANNING

. . . for individualizing

instruction

Faculty of Professional Studies

Research and Development Complex

State University College at Buffalo, New York

Under grants from

United States Office of Education

and

New York State Education Department

1.2 This supplement supercedes previous document No. 1

COMPUTER BASED RESOURCE UNITS AVAILABLE FOR REQUESTING

	Approx. Grade Level
American Cultural Revolution in the 20th Century (005)	9 - 12
Communication (917)	K - 6
Dental Health: Health Status* (058)	K - 12
Disease Prevention and Control* (060)	K - 12
Ecology and Epidemiology* (066)	7 - 12
Environment and Public Health* (065)	K - 12
First Aid and Survival* (068)	K - 12
I.T.P.A.** (043)	K - 6
Management of Social Behavior** (102)	K - 6
Movigenics** (006)	K - 6
My Home and Family (110)	K - 3
Nutrition* (057)	K - 12
Our Community (108)	4 - 8
Safety Education* (067)	K - 12
Sensory Perception* (059)	K - 12
Tobacco* (061)	K - 12
Trees to Toads: A Child's World (111)	K - 3
World Health* (070)	4 - 12

AVAILABLE FOR REQUESTING AND CURRENTLY UNDERGOING EXTENSIVE REVISION

Air Pollution (012)	6 - 8
American People (026)	3 - 9
Communities of Man (027)	3 - 9
Conservation of Natural Resources (016)	4 - 6
Going To and From School** (908)	K - 6
Job Interview (003)	9 - 12
(This unit will subsequently be called Career Education)	
Measurement** (002)	K - 9
News Media in American Society (015)	4 - 12
Speaking and Listening** (009)	K - 6
The Solar System and Beyond (020)	K - 6
Transportation (023)	K - 9

AVAILABLE FOR REQUESTING BUT USAGE NOT ENCOURAGED PENDING EXTENSIVE REVISION

American Civilization in Historical Perspective (024)	9 - 12
Drugs and Narcotics (011)	7 - 12
Human Growth and Development (007)	K - 9
Man and His Culture (013)	4 - 8
Quad and Trig Functions (036)	9
Smoking (014)	4 - 8

AVAILABLE JULY 1972

Drugs* (063)	K - 12
Mental Health* (064)	K - 12
Consumer Health* (069)	4 - 12
Alcohol* (062)	K - 12

AVAILABLE FALL 1972

Advertising and the Consumer
Development of Self Concept
Language and Communication
Society and the Nuclear Age
World of Work

*These Computer Based Resource Units were developed under the auspices of the Special Unit on Health and Drug Education of the New York State Education Department. Their content adhere closely to the curricula recommended by that department.

**Skill Development Programs use the same model and procedures for retrieval. They differ from Computer Based Resource Units in that they are not topical in their approach.

FOR FURTHER INFORMATION ON:

Cost, Request Procedures, or Unit Abstracts related to Computer Assisted Planning, direct your inquires to:

Computer Assisted Planning
Communications Center
Professional Studies Research & Development Complex
State University College at Buffalo
1300 Elmwood Avenue
Buffalo, New York 14222

(716) 862 5433

FOR FURTHER INFORMATION ON:

Theoretical rationale, unit development, and research related to Computer Assisted Planning, direct your inquiries to:

Computer Assisted Planning
Professional Studies Research & Development Complex
State University College at Buffalo
1300 Elmwood Avenue
Buffalo, New York 14222

(716) 862-5433